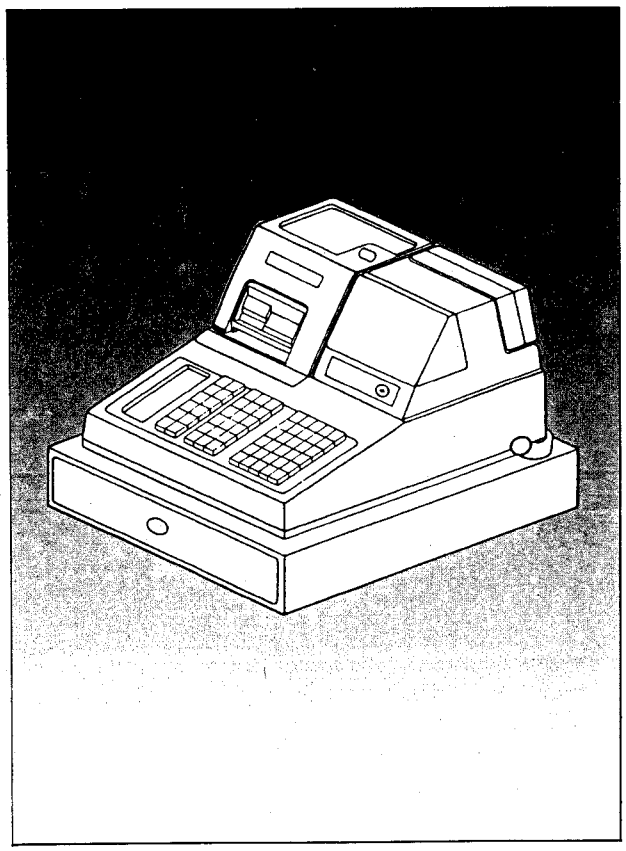
SAMSUNG

ELECTRONIC CASH REGISTER

ER-4615R
ER-4615 series
ER-4915 series

SERVICE Manual

ELECTRONC CASH REGISTER



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SYSTEM OVERVIEW

This ELECTRONIC CASH REGISTER is a microprocessor based system, using an 8-bit single chip microprocessor. This service manual provides technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please call our service branch. Schematics and specifications provide needed information for the accurate troubleshooting.
All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Samsung Electronics Co., Ltd. .

AREA	MODEL	KEYBOARD	PRINTER	SRAM	POWER TRANS
EUROPE	ER-4615R	MAX 60 Key	ERP-300V	62256	230V 50Hz
	ER-4615	60		62256	
	ER-4640	90		62256	
	ER-4800	160		62256	
U.S.A	ER-4915	60	ERP-300V	62256	120V 60Hz
	ER-4940	90		62256	
	ER-4900	160		62256	

Note:
Prior to using this Electronic Cash Register (ECR) for the first time, leave it powered on in the "REG" mode for at least twenty-four hours. This allows the Ni-Cad battery, which maintains the memory of the ECR while the power is off, to charge completely.

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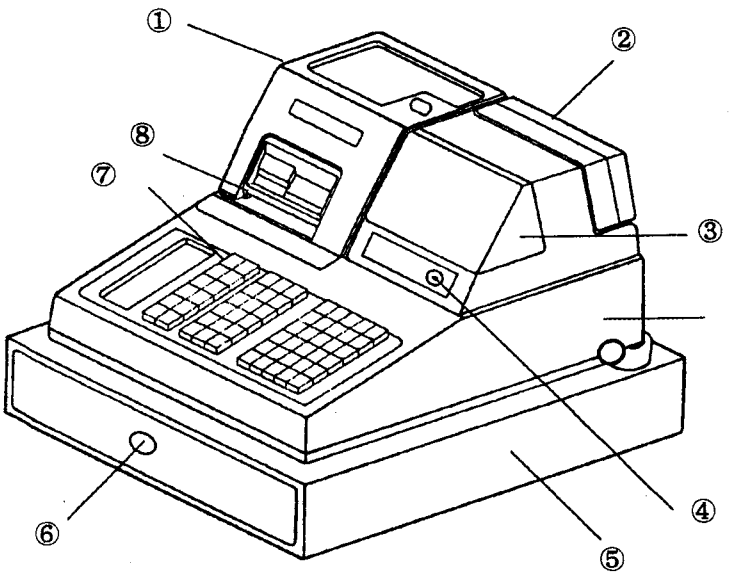
1. Product Specifications

ITEM	DESCRIPTION	REMARK
POWER SOURCE	120V AC ±10% 60Hz 230V AC ±10% 50Hz	
POWER Consumption	34watts (MAX)	
Printer	ERP-300V 9- Pin dot matrix printing speed : 3.0 lines/sec	
PROCESSOR	INTEL 8032 / 8052	
MEMORY	SRAM : KM62256 EPROM (27C512)	Battery back-up
BATTERY	Ni-Cad,60mA, Charge time : 24hours Lithium,3V,950mAH	 ER-4615R
DRAWER	4B/8C,5B/5C wait : 9.0 kg Dimension : 460(W) x 60(L)x110(H)	
DIMENSION	450(L) X 400(W) X 309(H)mm	
WEIGHT	18.3Kg	
DISPLAY	FRONT : 10 DIGITS REAR : 9 DIGITS	
KEY-BOARD	60 KEY (MEMBRANE TYPE) 15 KEY : DEPARTMENT KEY	

2. Features, Dimensions, Installation and Operation Instructions

2-1 Features



① COVER PRINTER

② TURRET DISPLAY

③ WINDOW DISPLAY

④ MODE SWITCH

⑤ DRAWER

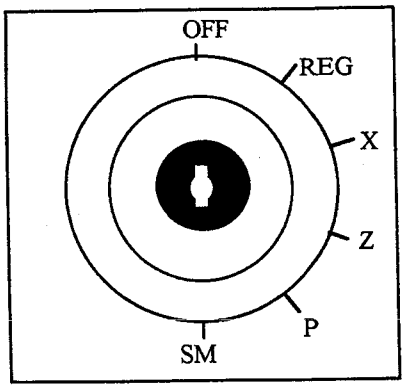
⑥ DRAWER LOCK KEY

⑦ KEYBOARD

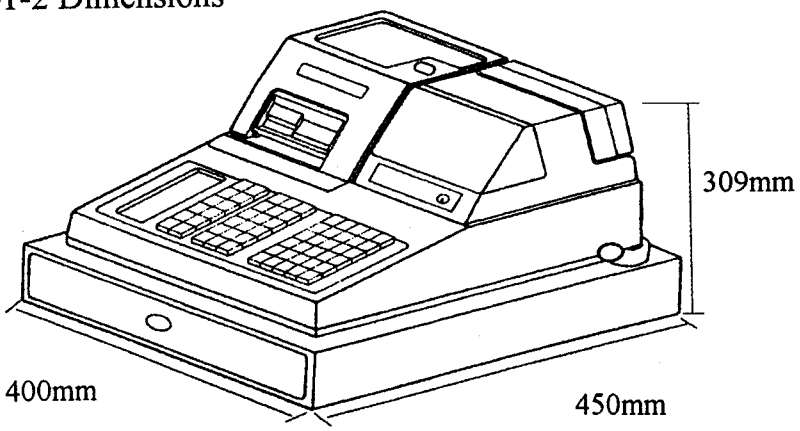
⑧ IMPACT DOT PRINTER

2-1-1 Mode Switch

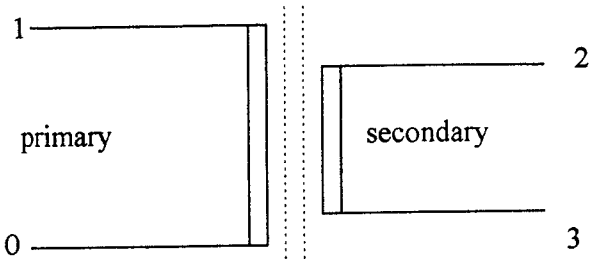
MODE	FUNCTION
OFF	Operation stop
REG	Sales Operation
X	X level reports
Z	Z level reports
P	Program mode
SM	Service mode



2-1-2 Dimensions



2-2 Comparison Chart



Transformer

AREA	PRIMARY	SECONDARY
EUROPE	230V 50Hz	2-3 22.5V(AC)
USA	120V 60Hz	2-3 22.5V(AC)

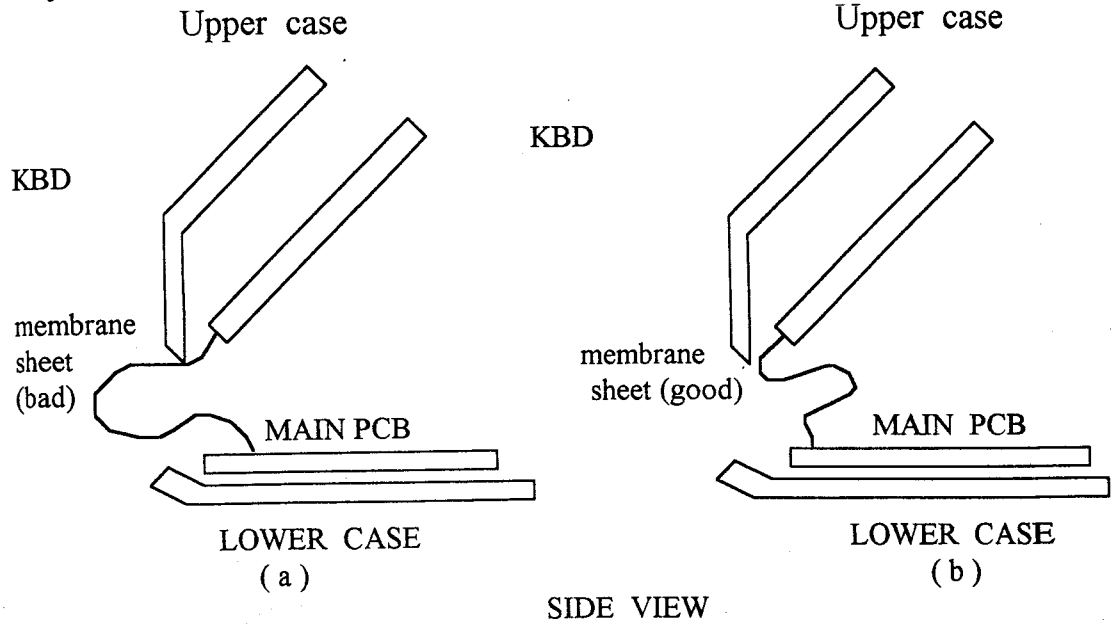
AREA / LO. NO.	EUROPE		U. S. A.	
	SPEC	CODE NO.	SPEC	CODE NO.
FUSE	T3.15L 250V	949 115010TH	T3A,125V	949 115202SLNA

2-3.Installation

2-3-1 General warning

When you connect the keyboard to the MAIN PCB , make sure membrane sheet is the shape as shown in figure (b) .

If you assemble as in figure (a), the keyboard may malfunction.



SIDE VIEW

2-3-2 Drawer setup

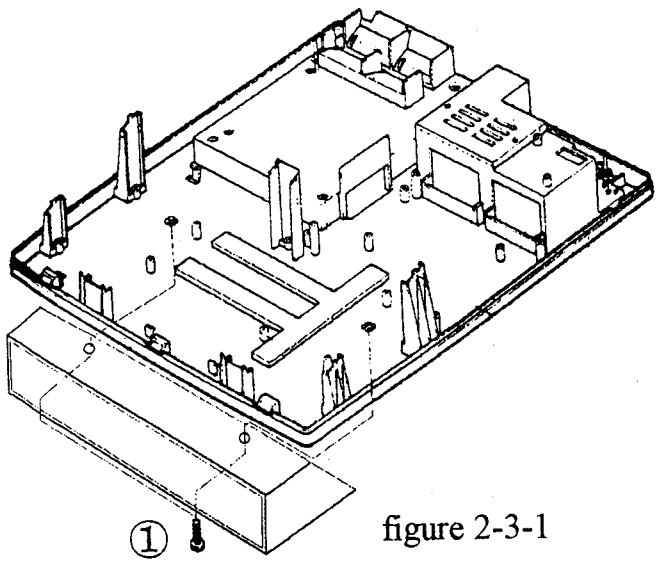


figure 2-3-1

To install the drawer in the lower case, fix the ① screws, as you see in the figure, together with the drawer and lower case. Refer to the exploded diagram for the disassembly details for other parts of ECR.

2-3-3 Ribbon cassete setup

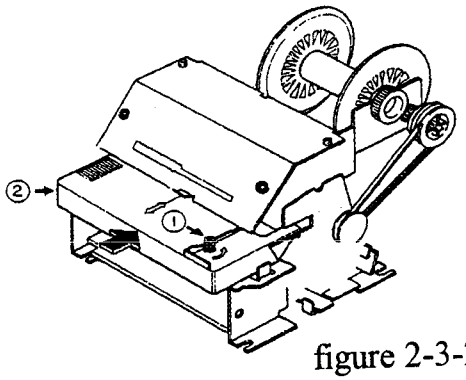


figure 2-3-2

(1) Before inserting the ribbon cassette, turn the knob(①) counter clockwise in order to prevent twisting ribbon.

(2) After inserting the ribbon cassette, turn the knob(①) counter clockwise in order to prevent twisting ribbon.

2-3-4 Insertion of Receipt / Journal paper

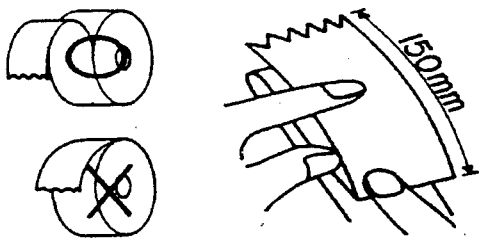


figure 2-3-3

Ⓐ Under the condition of marked ○ paper, unroll the paper about 150 mm, then fold the paper like figure 2-3-3

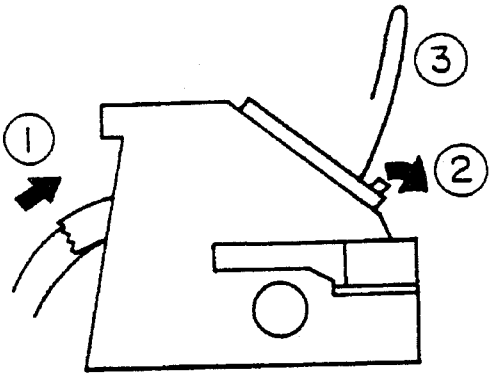


figure 2-3-4

Ⓑ Insert the folded paper in the back ① of ERP-300V.

While holding the lever ② down, pull the paper out until the fold point ③ is completely out of the machine.

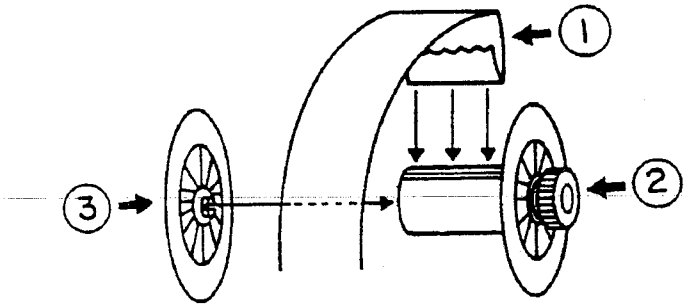


figure 2-3-5

ⓒCut the receipt side paper.

ⒹInsert the journal side paper in the slit of the rewind spindle. Wind spindle 3 or 4 times.

Push disk ③ onto the spindle as shown in figure 2-3-5

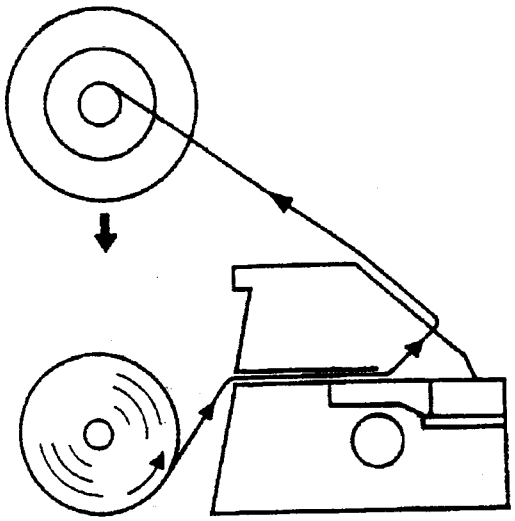


figure 2-3-6

Ⓔ When the journal side paper is loose, rewind the spindle to make the paper tight.

2-4. Operating Instruction

2-4-1 Initial Clear

The Initial clear procedure may be used for clearing keyboard lock-ups and constant error conditions. This procedure will finish the current transaction / operation and clear temporary memory buffers. An initial clear procedure will not effect register programming , or erase previously stored totals in RAM memory.

Caution: 1) An initial clear will cause balancing discrepancies if it is performed in the middle of a transaction.
2) If you 'Power ON' while the display connector on the PCB is open, it may harm the system, especially the CPU.

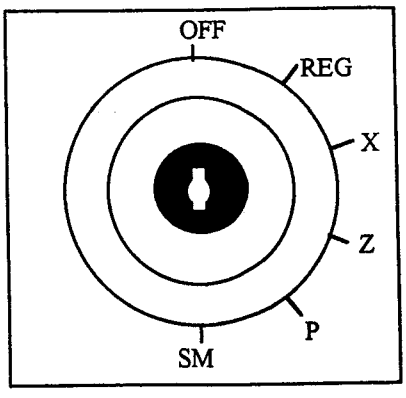
Turn the keylock to the " P " position on the mode key plate and press the "SUBTOTAL "Key. While holding the "SUBTOTAL" key down, power 'ECR' off and power it back on. Then, the following receipt will print.

```
--------------------------------
RAM ALL CLEAR OK !
--------------------------------
CLERK 0    NO. 000001
TIME 10:19       0000
DATE 06.10.'94
```

2-4-2 Clearing Totals From Memory

The memory of register must be RAM Cleared before initial programming take place. Having the "C" key in the SM-Mode position allows for memory clearing.

- See the diagram to locate the SM-Mode position.



SM-mode keylock position

2-4-3 Total Memory RAM Clear (00 Key)

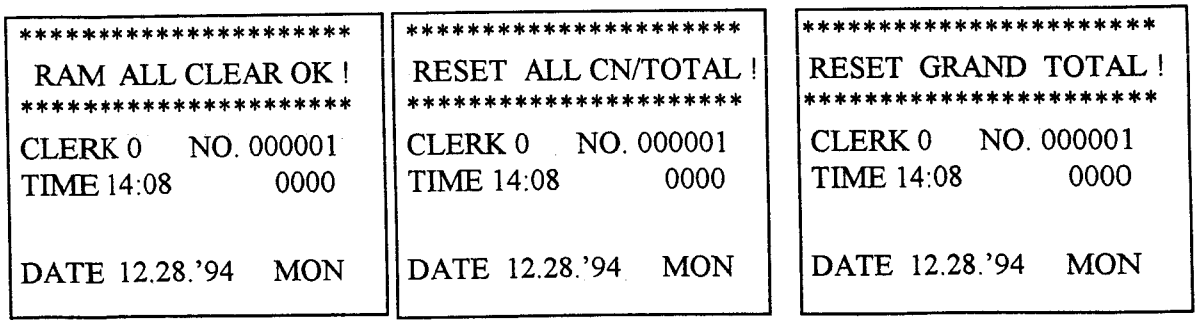
Clearing the RAM on the cash register erases all totals and installs the default program. This procedure must take place before programming the cash register.

2-4-4. Clear all RAM memory

Use this procedure to clear totals from memory.

1) Unplug ECR.
2) Insert the key (marked 'C') into the control lock and turn clockwise, past the position marked 'P', to the Service mode (SM). This position is not marked on the control lock plate, but the 'C' key can travel to this position.
3) While holding the "00" key down, power the register off and back on.
4) Switch off the CN21 shunt switch (near keyboard connector CN11) by changing the shunt switch position 'on' to 'off'. After this procedure, "total memory RAM clear " cannot be performed. If you want this procedure after installation, you have to switch CN21 on(only for ER-4615R).
5) Continue to hold the key down until the receipt printer stops printing and the display shows 0.00.

KEYS



Key : 00
Total memory
RAM Clear

Key : CHECK
Reset All
Total & counters

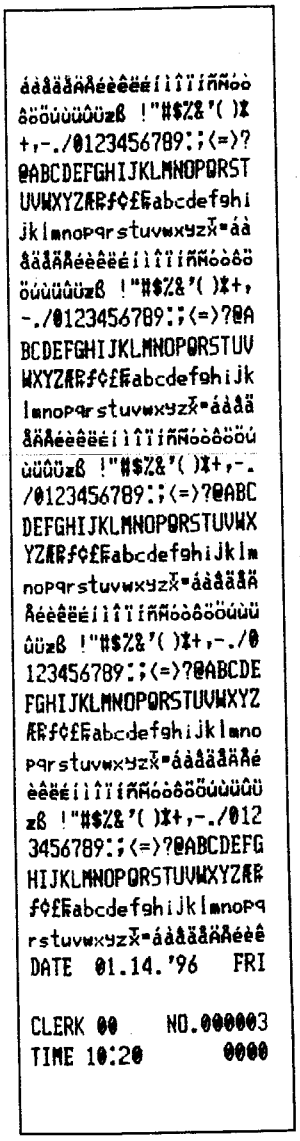
Key : CASH
Reset Grand Total only

2-4-5 Service Mode Diagnostics

The Samsung register offers several diagnostic routines while in the SM or Service Mode. Each of these tests require the "C" key to be turned to the SM Mode position. See Illustration on page 6.

The available diagnostics are :

Printer / display Test :
Enter 1 and press the CASH TEND Key. The register will cycle completely through the print character set while testing the display.



Printer Test

Keyboard Test
Enter 2 and press the CASH TEND key. Press each key on the keyboard, one key at a time. Each key shows its location code on the display as you press it.

Exit the keyboard ' test mode ' by pressing the " CLEAR " key twice.

Keylock Test :
Enter 3 and press the CASH TEND key. The corresponding code will appear on the display as the "C" key is rotated from position to position.

2-4-6 EPROM Check Sum

Enter 4 and press the CASH TEND key. The software version and the Check sum data will print on the receipt.

```
**********************
MODEL       :ER-4615R
VERSION NO :STAND01
CHECK SUM :IF8A
**********************
CLERK 0     NO. 000004
TIME 14:11          0000
DATE 12.28. '94     MON
```

2-4-7 Setting the number of departments

1) Insert the " C " key into the control lock (see page 6) and turn clockwise to the SM (service) mode position. This position is not marked on the control lock plate, and only the "C" key will travel to this position.

2) Enter the following key sequence

(XX) - [X/TIME] - [CASH/TEND]

XX : ER-4915 (5,10,15)
ER-4940 (15 , 40)
ER-4615 (5,10,0[15])
ER-4615R (5,10,0[15])
ER-4640 (15,0[40])

Refer to the Other departments programming, see the 'user manual'.

Now , the Samsung ECR is ready to operate using the default program. The balance of programming procedures take place with the 'control lock' in the 'P' position.

3. Troubleshooting

1) "P.P. " on the display during POWER ON.
- Check for disconnection of connector between MAIN PCB side and 'PRINTER side ' (CN7CN8CN13).
- Check the Printer Ribbon and Paper Jam.

2) Buzzer Sound during POWER ON.
- Check whether the display connector is connected or not.
- Check whether the turret connector is connected or not.

3) " ⊏ | " on the display .

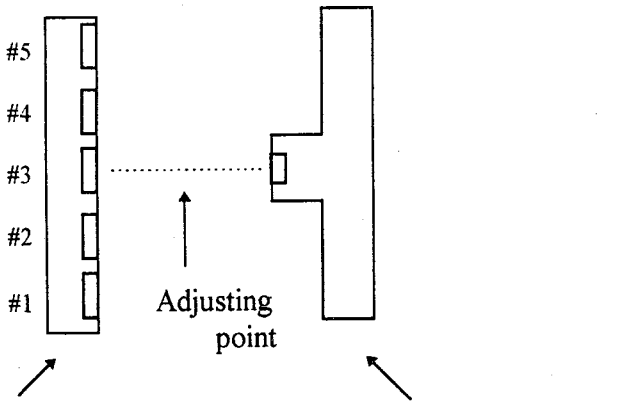
- Press the " CLEAR" key to clear this condition.

Refer to other message , see the user manual .

4 Alignments and Adjustments

4 -1 Adjusting of Roll paper Near-end Detector (Type 1 paper sensor)

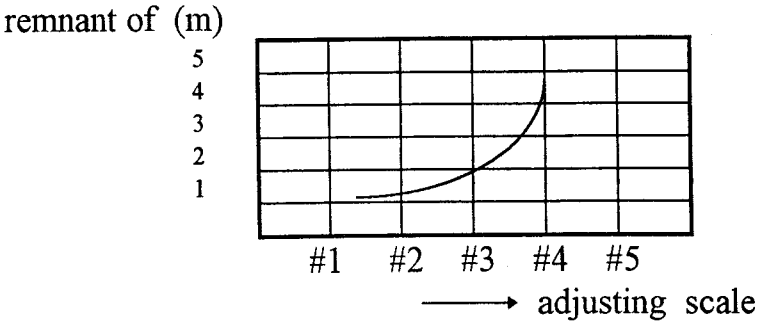
1) Adjusting Point



(PAPER T= 0.075 mm)

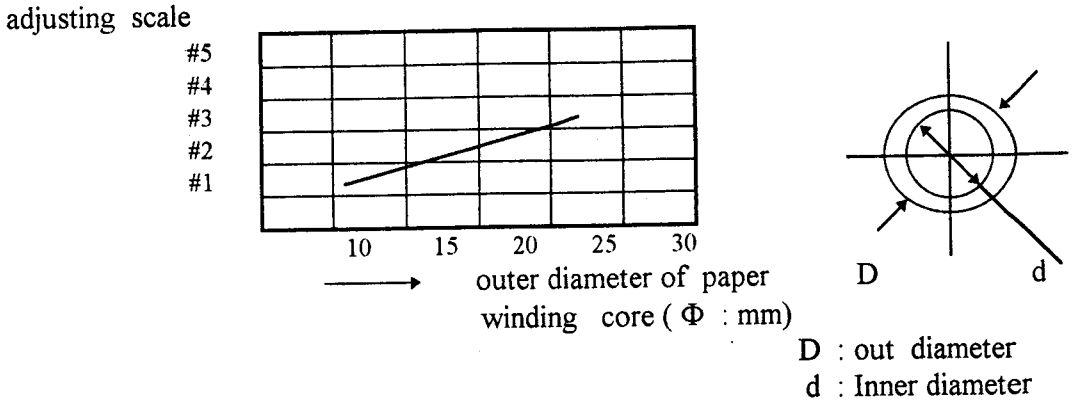
As you see in the figure above, the slide bracket is fixed at adjusting scale #3 for the roll paper recommended by Samsung.

2) The relationship between adjusting scale and the remnant of Roll paper : When using Samsung recommended roll paper (paper thickness = 0.075mm, paper width = 44.5 ± 0.5mm), the relationship between adjusting scale and remnant of roll paper is as follows.



When using paper other than Samsung recommended paper (thickness: approx. 0.075mm), ignore the figure above.

3) The relationship between adjusting scale and ROLL paper winding core :



(note)

a) When employing roll paper other than Samsung recommended paper, the length of remnant of roll paper will be differ.

b) When using roll paper with a red end mark at the end of it, winding core may be pulled out of its holder due to the paper sticking to the winding core. The paper sensor may malfunction if the winding core is pulled out of its holder.

4-2. ERP-300V Printer Adjustment

4-2-1.Procedure of disassembly

1) Remove the four screws [a] on the upper frame ass'y © and disassemble cover Ⓐ (see figure 4-2-1).

2) Remove the screws [b] (two) and disassemble the Ribbon Frame Ⓑ from the Lower Frame Ass'y Ⓘ as figure 4-2-1.

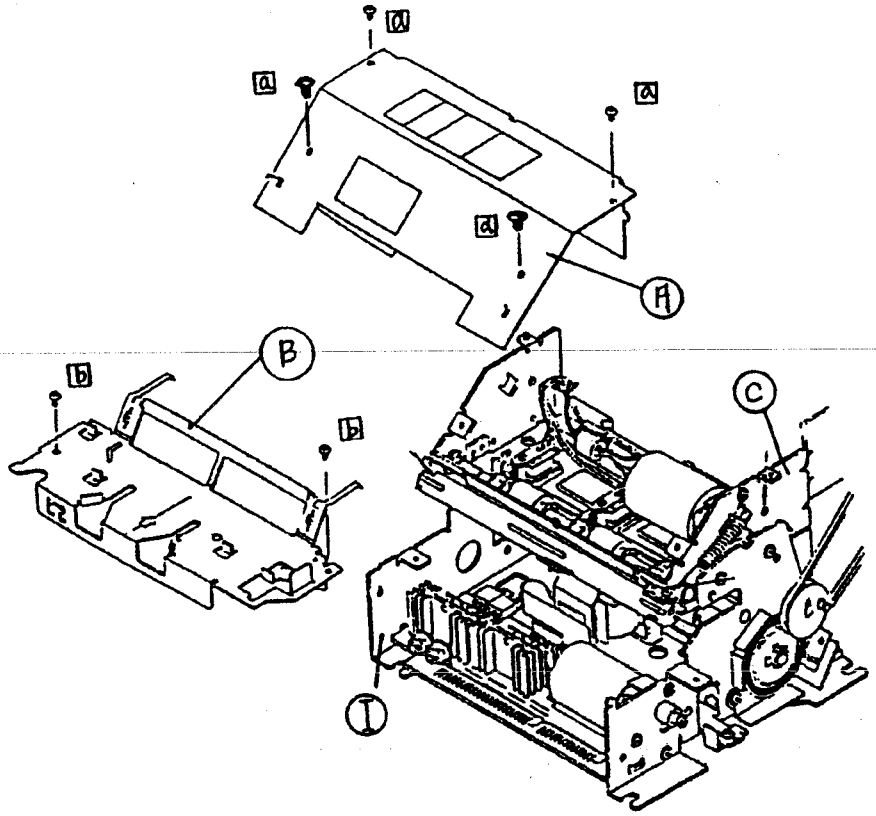
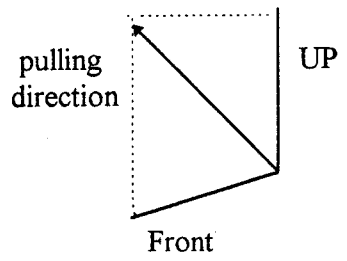


Figure 4-2-1 Printer Disassembly

3) Remove the four screws [C] and disassemble the Upper frame ass'y © from the Lower frame ass'y ①.

4)



When you disassemble the Upper frame ass'y © from the Lower Fame Ass'y ①, pull the © Ass'y up away from the Lower Frame Ass'y like the direction of the diagram .

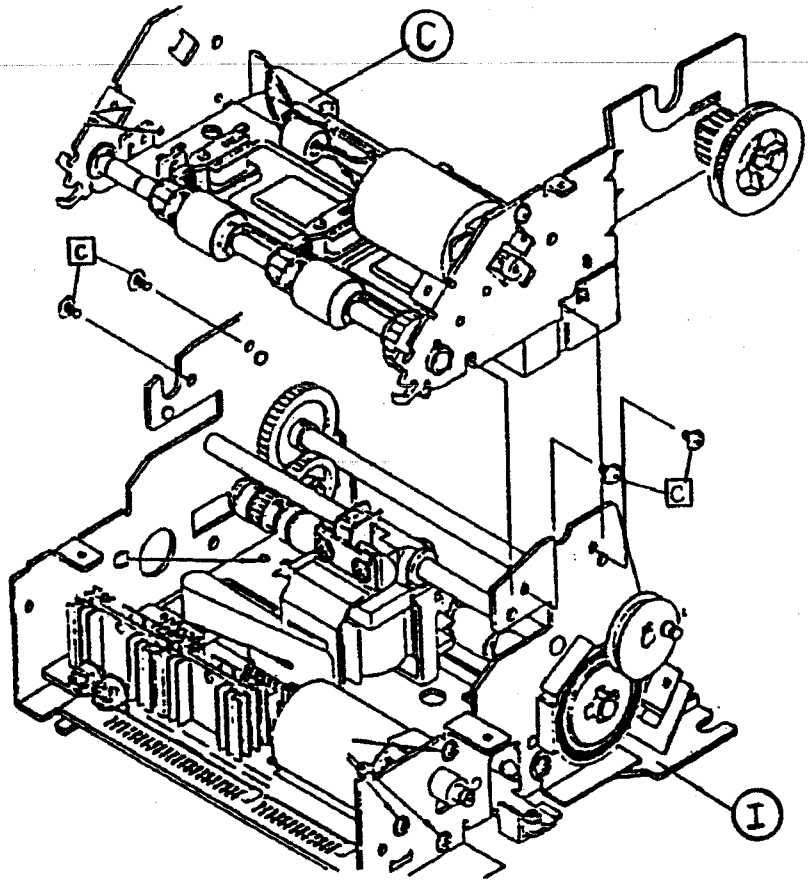


Figure 4-2-2 Separating the Upper + Lower Frame Aaa'y

5) Turn the upper Frame Ass'y © upside down and remove the three screws [d]. Disassemble the Stamp Paper Guide Ass'y Ⓓ from the Upper frame ass'y ©.

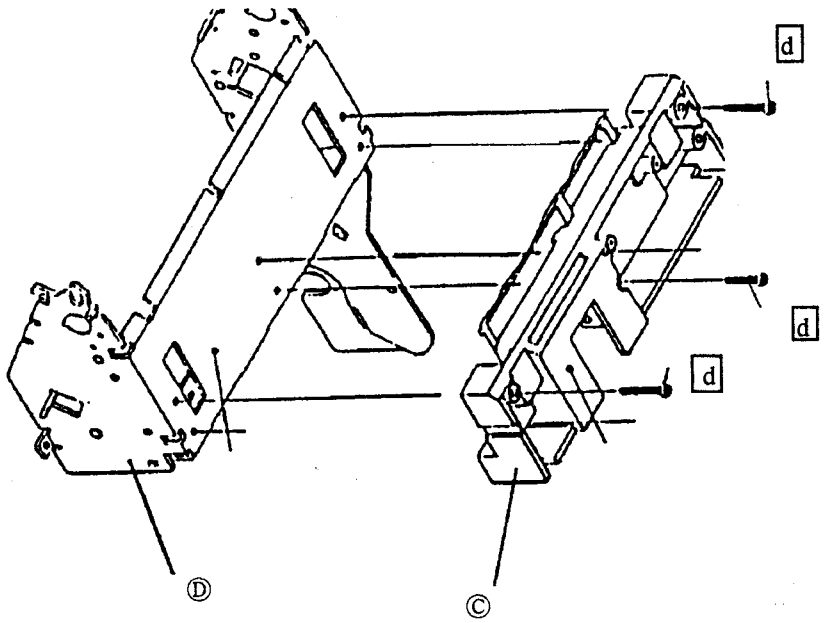


Figure 4-2-3 Stamp Paper Guide Removal

6) Remove the Platen Paper Guide Ⓔ's left side screw [e] which ties the platen paper guide Ass'y Ⓔ to the Stamp paper guide ass'y Ⓓ.

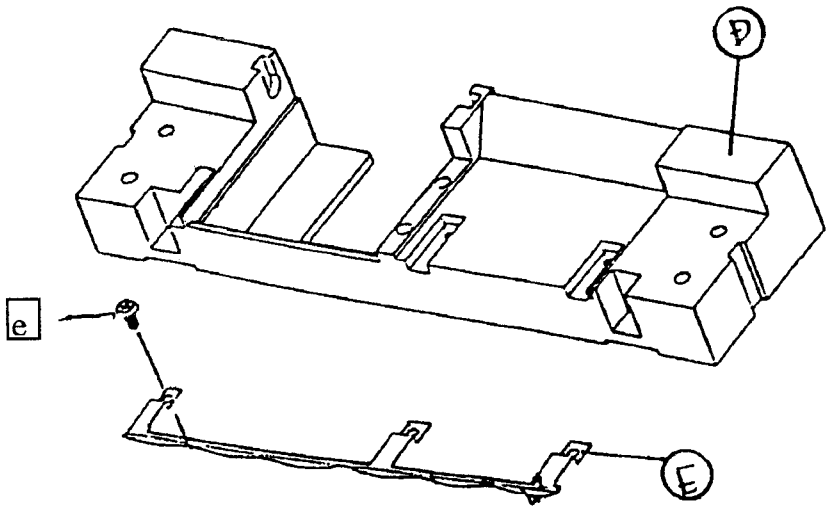


Figure 4-2-4 Platen Paper Guide Removal

4-2-2 Printer Assembly

1) When you assemble the printer, do the reverse sequence of the disassembly procedure.

- Caution : ① When you adjust Head Gap, see and follow the head head gap adjusting method (next page).

: ② When you adjust upper frame Ass'y ©, locate STAMP PUSHER(F) on hatched area as you see in the assembly diagram.

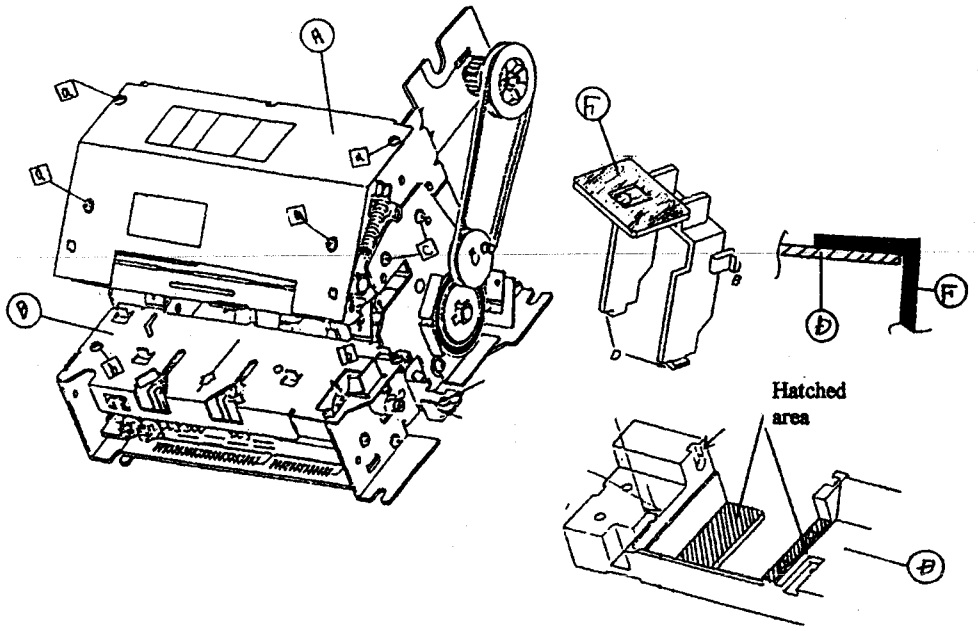


Figure 4-2-5 Printer Assembly Diagram

4-2-3 Head Gap Adjusting Method

- PROCEDURE

1) Assemble the Upper Frame Ass'y Ⓐ to the Lower Frame Ass'y Ⓘ by reverse sequence of disassembly procedure. Loosely fix the screws.

2) Wind Head Gear counter clockwise, move the Head to the right end of platen guide. Insert Gap Gauge (width 0.5mm) between Head and platen. Assemble the two screws Ⓒ tightly.

3) In the same method, wind Gear and move the Head to the left end of platen guide. Insert GAP GAUGE (0.5mm) and assemble the two screws Ⓒ (left side).

4) When the Ⓒ screws are in place, Nej-Lock (kind of bond) on the position of the four screws Ⓒ.

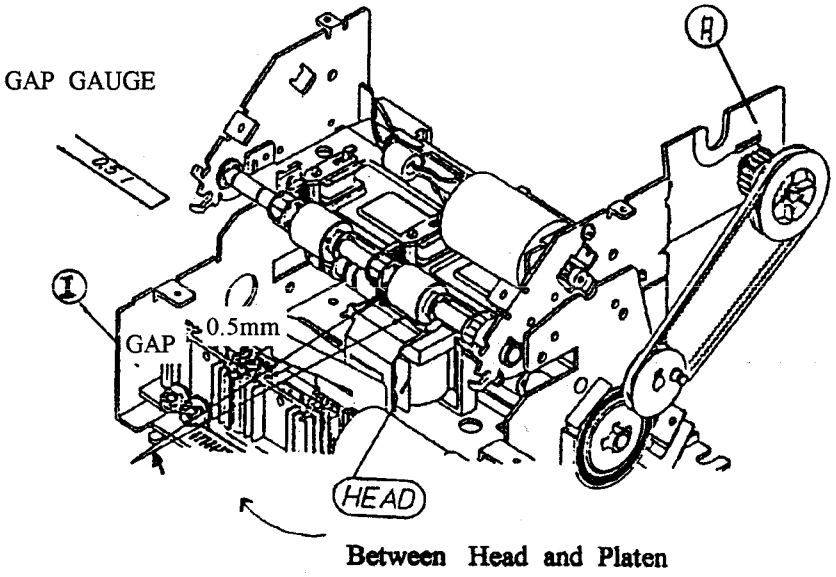


Figure 4-2-6 Head Gap Adjustment

5. Circuitry

5-1 Power Circuit

This ECR has two different power sources, a power circuit and a Battery circuit. The power circuit supplies three different DC voltage sources, +5V for the LOGIC, +24V for driving the Printer and the Display circuit, and +28V for the printer head driving. The BATTERY applies +3.6V to the back-up circuitry.

1) Printer and Display driving Voltage

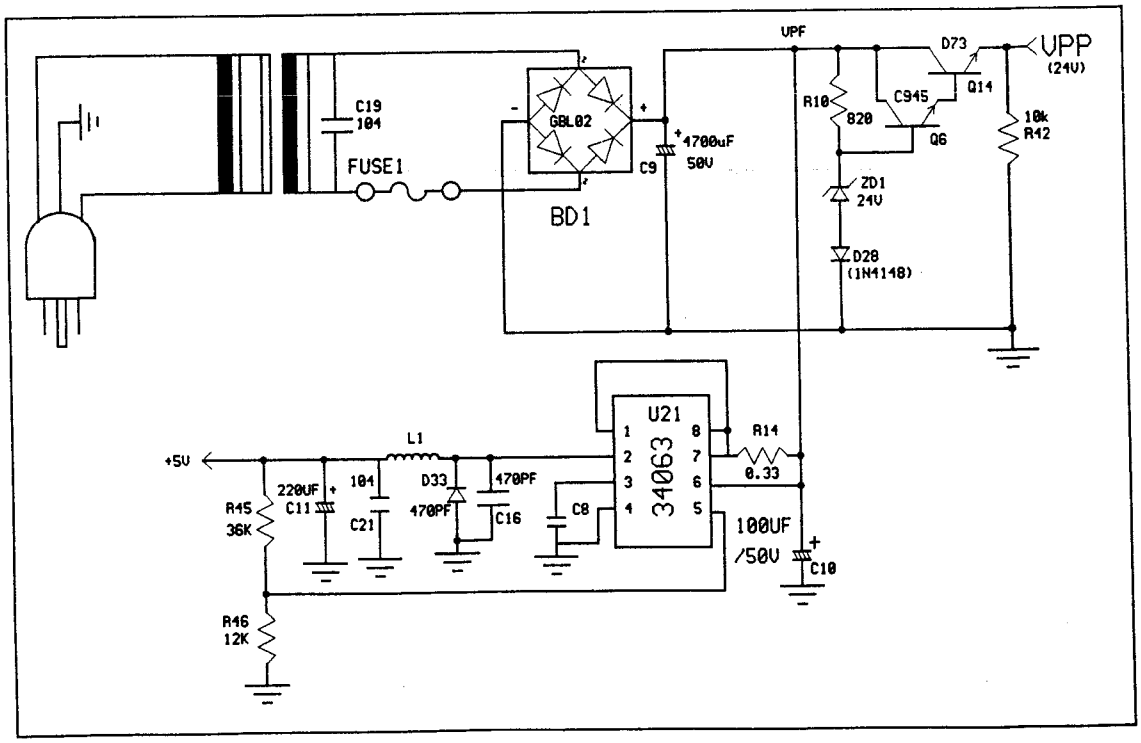
The V_{PP}(24V) voltage is used for the source voltage of the printer driving and display circuit. As shown in the power supply circuit, the secondary AC output voltage of power transformer is converted to DC voltage by the BD1 (bridge diode) and smoothed by a smoothing capacitor C9 (4700uF). This smoothed voltage is supplied for Motor, print-head and display unit. The switching circuit is composed of two transistors Q14,Q6 and two diodes (ZD1,D28).

2) Logic IC Driving Voltage

+5V for Logic IC is supplied from DC converter (U20). The DC converter IC MC34063 generates rectangular waves by connecting +28V to pin6. This output is converted into DC voltage (+5V) by L1 , C21 and C11. When the internal switch of U20 (pin2 of U20) is turned on, energy is charged in choke coil L1 and when turned off, coil L1 generates electro-magnetic force. As D33 is a re-circulation diode, it is an e.m.f (electro-magnetic force) path. C11 smoothes the output voltage and R45 and R46 are for voltage feedback.

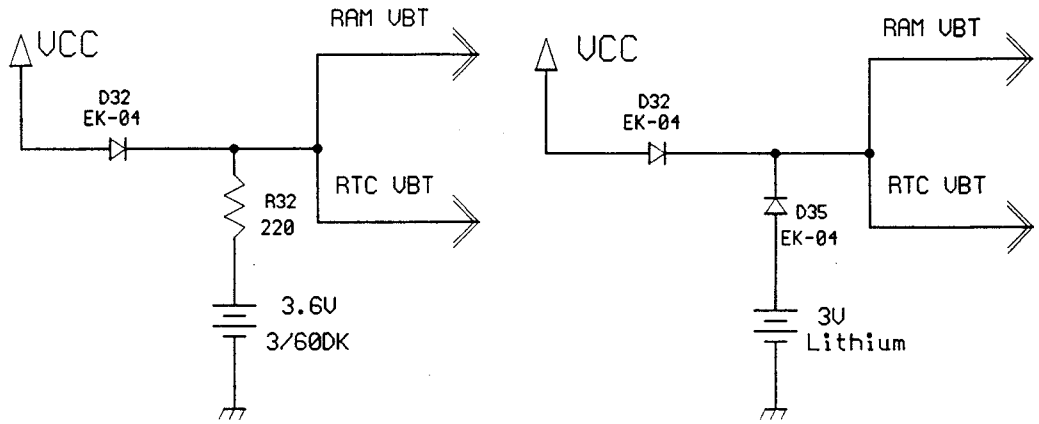
3) V_{PH}(+28V)

The V_{PH} (+28V) voltage is used for the driving voltage of the print head solenoid. V_{PH} voltage level may rise or fall when AC input voltage varies.



5-2 Battery Circuit

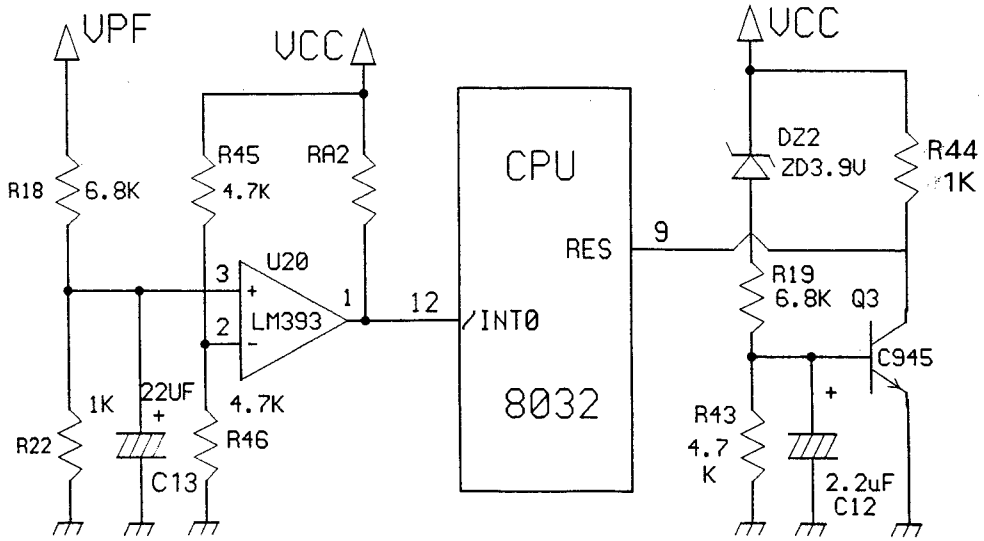
In this register we use two kinds of battery. One is re-charge battery (type 1), other is lithium battery (type 2). In type 1, when the AC power is turned on, the V_{CC} voltage goes to the Battery through D32, R32 for the charge. When the AC power is turned off, the Battery voltage goes to the RAM and RTC (real time clock) IC. In type 2 battery, when the AC power is turned on , battery is not charged. So to speak, the lithium battery is constantly discharged when the input voltage is less than 3V.



TYPE 1 TYPE 2(ER-4615R)

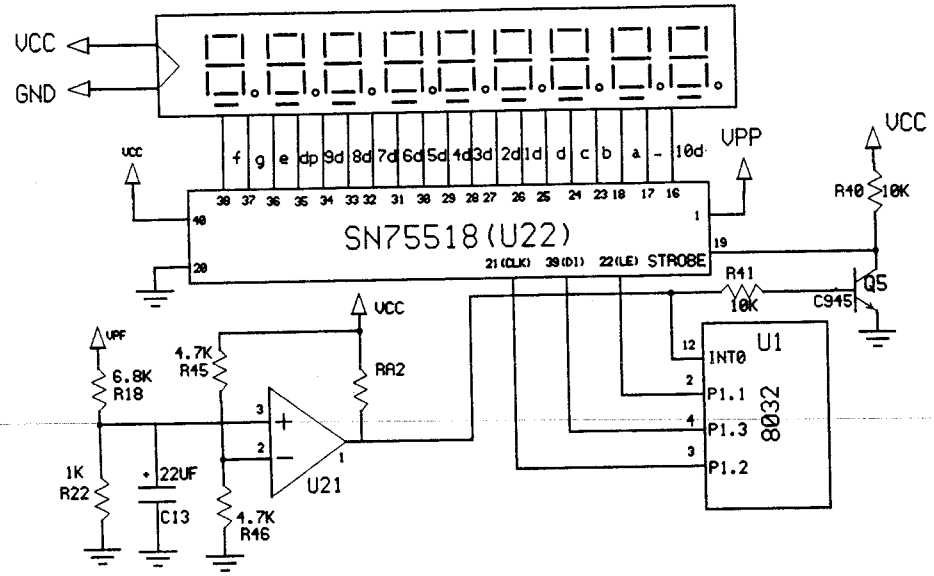
5-3 Reset and power fail circuit

The reset circuit prevents the CPU from starting to operate before the voltage goes to the logic IC operation level and the system is initialized. When the logic voltage of CPU goes down below the normal operating level, such as main power off, this power fail circuit protects / saves the status of the CPU and the RAM data .



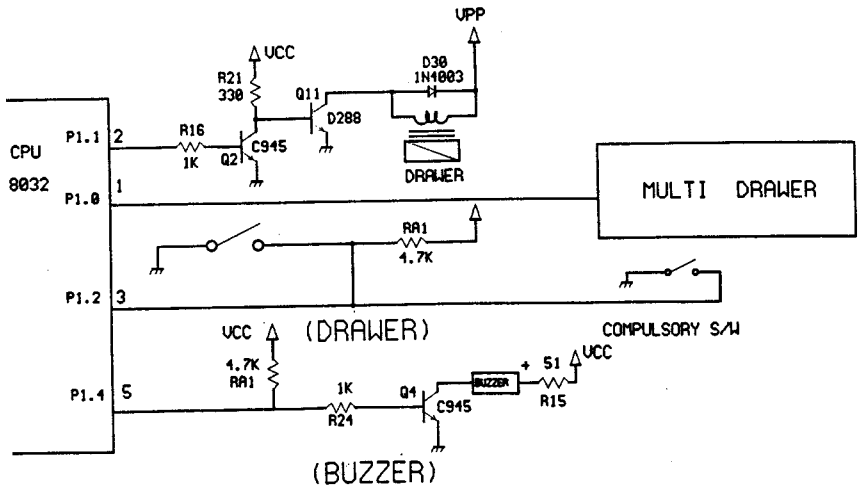
5-4 Dissplay circuit

Display device is activated by U22 IC (SN75518). Display circuit is composed of front display and rear display. The CPU sends the digit and segment signals to U22 (SN75518). The SN75518 is designed to drive a dot matrix or segmented vacuum fluorescent display. This IC consist of a 32 bits shift register, 32 latches, and 32 output 'AND' gates. Serial data is entered into the shift register on the low-to-high transition of CLOCK, while Latch Enable is high, parallel data is transferred to the output buffers through a 32 bit latch. Data present in the latch during the high-to-low transition of Latch Enable are latched. When strobe signal is low, all Q outputs are enabled .



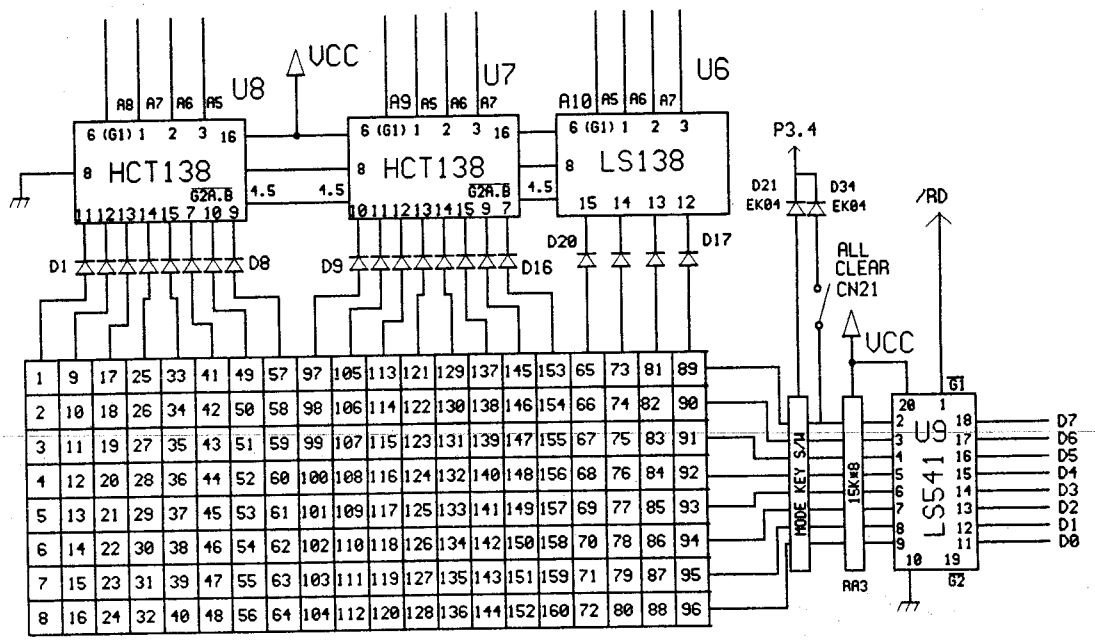
5-5 Drawer and Buzzer circuit

This circuit is used for opening cash drawer and driven by CPU port p1.1, p1.0 (p1.0 is used for multi-drawer). When p1.1 or p1.0's states is low level signal, TR Q2 and Q11 drive the drawer solenoid to open the Cash Drawer. As an optional item, we provide sensor switch(we call it a compulsory switch) which checks the drawer whether it is opened or not. This sensor switch turn on for the drawer open condition, and turn off for the other. The buzzer is activated by the ON/OFF state of CPU Pin 5.



5-6 Keyboard Circuit

The CPU sends scanning data to the decoder IC (74HCT138) sequentially. When the key switch is pressed, the decoded signal goes to the input pin of buffer IC U9(74HCT541), and then CPU reads the returned data from the output pin of the buffer U9 (74HCT541). The CPU (p3.4) sends a mode scan data to the mode switch, and then the CPU reads mode return data from the output pin of the 74HCT541.



41	42
33	34
25	26
17	18
9	10
1	2

43	35	27
44	36	28
48	40	32
47	39	31
46	38	30
45	37	29

19	11	3	51	59
20	13	4	52	60
24	16	8	56	64
23	15	7	55	63
22	14	6	54	62
21	13	5	53	61

60 Key Table

8	96	89	1	2	90	91	3	6	94	92	4	5	13	15
88	80	73	81	82	74	75	83	86	78	76	20	21	53	55
24	72	66	17	18	66	67	19	23	70	68	28	29	61	63
48	64	57	41	42	58	59	43	46	62	60	44	45	77	79
40	56	49	33	34	50	51	35	38	54	52	36	37	69	71
32	16	9	25	26	10	11	27	30	14	12	84	85	93	95

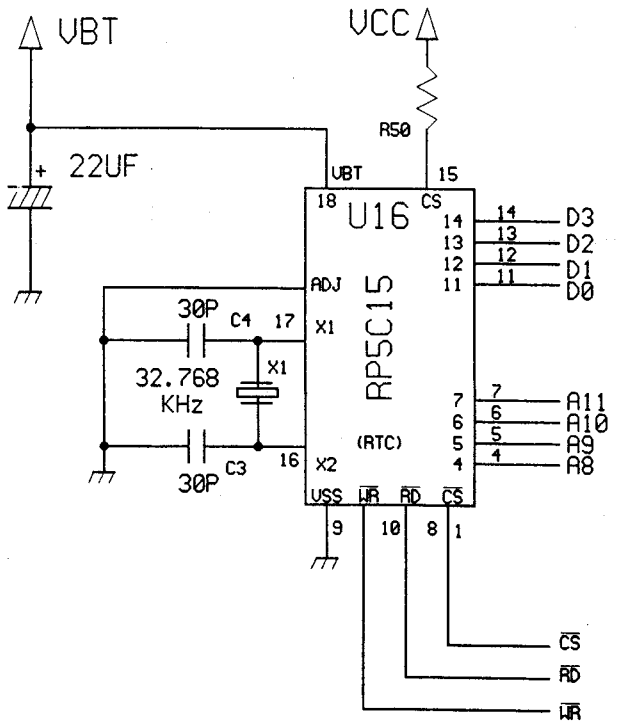
90 Key Table

8	16	24	32	112	48	88	72	64	56	80	104	128	136	144	152
7	15	23	31	111	95	87	71	63	55	79	103	27	135	143	151
6	14	22	40	110	94	86	48	62	54	78	120	126	134	142	160
5	13	21	39	109	93	85	47	61	53	77	119	125	133	141	159
1	9	30	38	105	89	70	46	57	49	102	118	121	127	150	158
2	10	36	37	104	90	69	45	58	50	101	117	122	130	149	157
4	17	25	33	108	81	65	41	60	73	97	113	124	137	145	153
3	18	26	34	107	82	66	42	59	74	98	114	123	138	146	154
12	20	28	36	92	84	68	44	52	76	100	116	132	140	148	156
11	19	27	35	91	83	67	43	51	75	99	115	131	139	147	155

160 Key Table

5-7 Real time clock circuit

The clock circuit is composed of real time clock IC U5 (RP5C15), a crystal and two capacitors. The CPU reads a time data from RP5C15, and writes a new time data to the RP5C15. The address lines respectively mean the contents of the second, minute, hour, etc.



5-8 PRINTER CIRCUIT

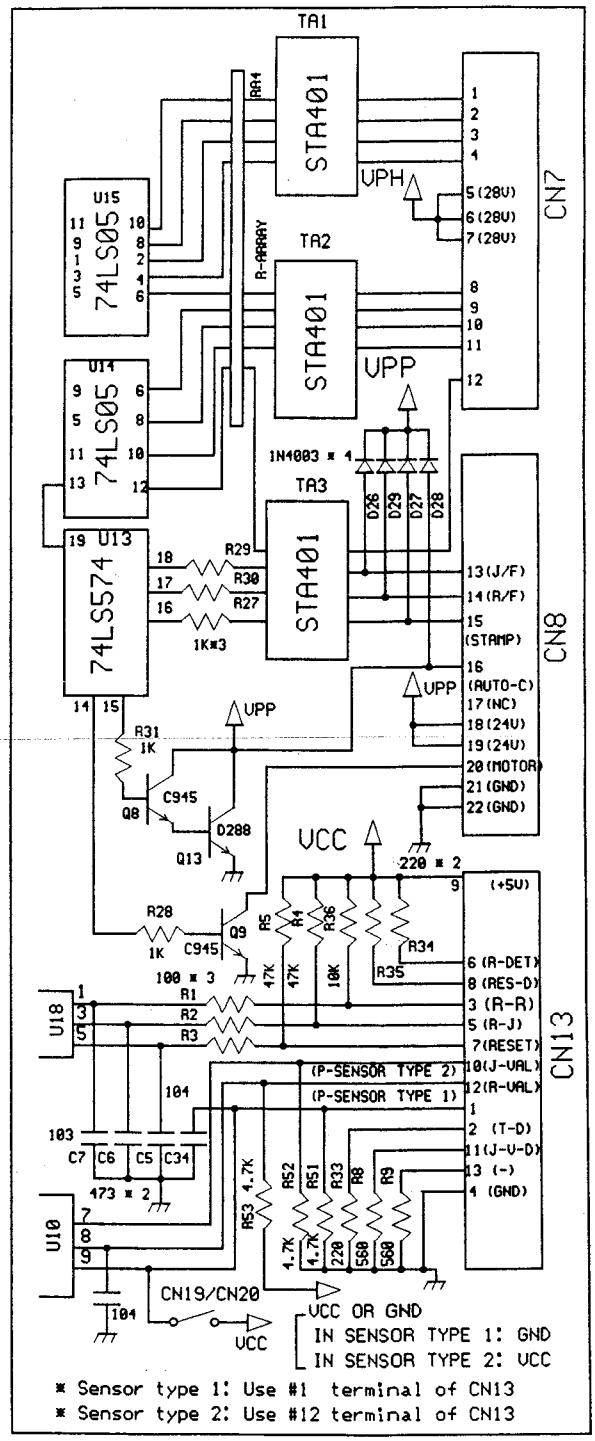
This register uses the Samsung ERP-300V Dot Printer.The CPU sends high signal to pin 14 of U13, and then Q9 (C945) is turned on. As a result, the motor in the printer starts to rotate.
The printer generates the timing pulse which determines the position of the character.
The CPU detects the timing pulse,compares the pulse count with the data for printing. If the counted number is included in the data printing area, the CPU sends a high signal to the Latch 74HCT574 during the next pulse.
TR array STA401 / STA471, INVERTER IC 74LS05s are used for 9pin-head driving. For receipt Feeding and Journal Feeding 74HCT574 and STA401s are used.

There are two kinds of paper sensor, so to speak, 'type 1' and 'type 2'.

Type 1 paper sensor is installed outside of ERP-300V printer.

Type 2 paper sensor is installed inside of ERP-300V printer.

The detailed paper sensor circuit is continued in next page.

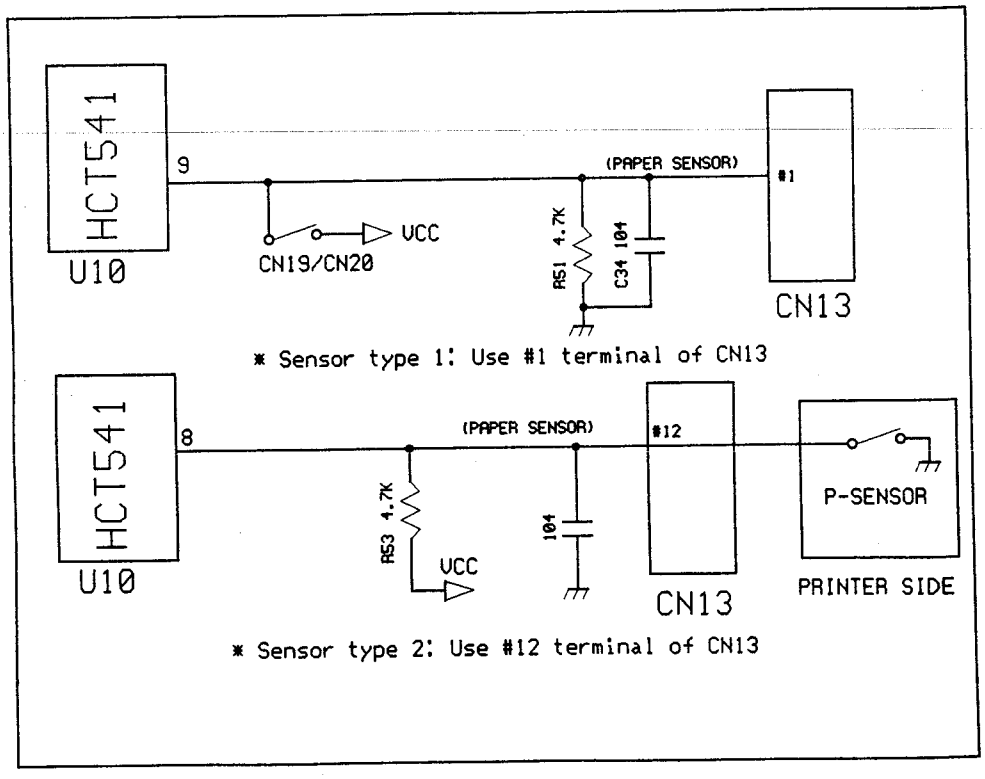


5-9 Paper Sensor Circuit

This ECR uses two kinds of paper sensor, so to speak, type 1 and type2.

Type 1 paper sensor : Installed outside of ERP-300V printer.
Type 2 paper sensor : Installed inside of ERP-300V printer(ER-4615R).

The detailed circuit is as follows.



6 Specification of Major Components

6-1 Printer (ERP-300V)

1) Specifications

1.1 Printing Method : Mechanical serial dot matrix type

1.2 Printing Direction : Bi-directional (Both left and right)

1.3 Printing Speed : 3.0 lines / sec (PCT = 330 to 390m sec, 24V DC, 25)

1.4 Printing format :

1) number of wire : 9

2) Dot Interval

- Horizontal : 0.353mm
- Vertical : 0.350mm

3) Total number of dots

- Receipt side : Max 107 dots / 213 positions
- Journal side : Max 107 dots / 213 positions
- Validation : Max 243 dots / 485 positions

4) Print font

9 x 9 (With half dots)	7 x 9 (With half dots)

5) Printing columns

	9x9 (With half dots)	7x9 (With half dots)
Receipt side	18 columns	21 columns
Journal side	18 columns	21 columns
Validation		40 columns

6) Character size (H x V)

1.7 X 3.1 mm (9x9)	1.3 X 3.1 mm (7x9)

7) Column interval

2.12 mm (9x9)	1.76 mm (7x9)

8) Line interval

5.1 mm (9x9)	5.1 mm (7x9)

1.5 Paper feed

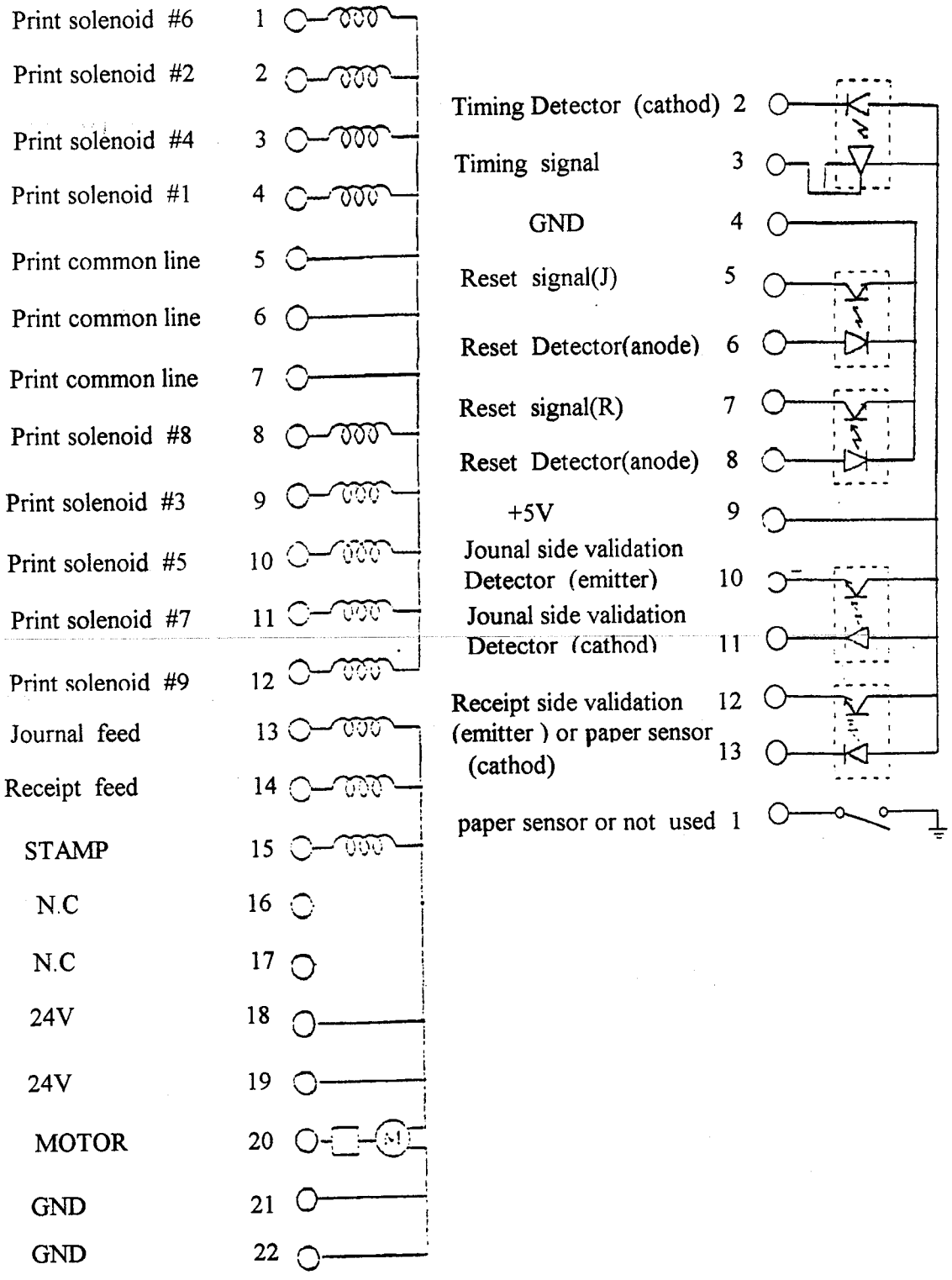
1) Receipt / Journal independent feed method

2) Fast feed speed :

Receipt : Approx. 26.5 lines/sec

Journal : Approx. 9.9 lines/sec

6-2 Printer Terminal Arrangement



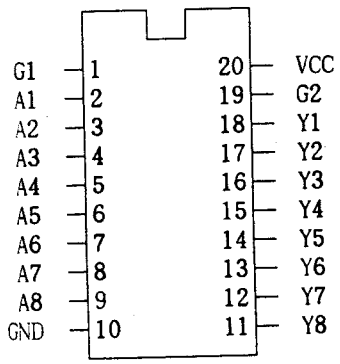
6-3 CPU PORT(8032/8052)

FUNCTION	I/O	NAME	CPU PIN
DRAWER1	O	P1.0	1
DRAWER2	O	P1.1	2
COMPULSORY	I	P1.2	3
LE(DISPLAY)	O	P1.3	4
BUZZER	O	P1.4	5
NE555 TRIGGER	O	P1.5	6
RAM /CS	O	P1.6	7
RAM SELECTION	O	P1.7	8
RESET	I	RESET	9
RXD(DISPLAY DI)	O	P3.0	10
TXD(DISPLAY CLK)	O	P3.1	11
INT0	I	P3.2	12
INT1	I	P3.3	13
MODE KEY	I	P3.4	14
RAM SELECTION	I	P3.5	15
/WR	I/O	P3.6	16
/RD	I/O	P3.7	17
X-TAL OUTPUT	O	XTAL2	18
X-TAL INPUT	I	XTAL1	19
VSS	-	GND	20

CPU PIN	NAME	I/O	FUNCTION
40	VCC	I	+5V
39	P0.0(AD0)	I/O	ADDRESS DATA BUS
38	P0.1(AD1)	I/O	ADDRESS DATA BUS
37	P0.2(AD2)	I/O	ADDRESS DATA BUS
36	P0.3(AD3)	I/O	ADDRESS DATA BUS
35	P0.4(AD4)	I/O	ADDRESS DATA BUS
34	P0.5(AD5)	I/O	ADDRESS DATA BUS
33	P0.6(AD6)	I/O	ADDRESS DATA BUS
32	P0.7(AD7)	I/O	ADDRESS DATA BUS
31	/EA	I	GND
30	ALE	O	ADDS LATCH ENABLE
29	/PSEN	O	PGM STORE ENABLE
28	P2.7(A15)	I/O	ADDRESS BUS
27	P2.6(A14)	I/O	ADDRESS BUS
26	P2.5(A13)	I/O	ADDRESS BUS
25	P2.4(A12)	I/O	ADDRESS BUS
24	P2.3(A11)	I/O	ADDRESS BUS
23	P2.2(A10)	I/O	ADDRESS BUS
22	P2.1(A9)	I/O	ADDRESS BUS
21	P2.0(A8)	I/O	ADDRESS BUS

6-4 GENERAL SPECIFICATION OF ICs

74HCT541

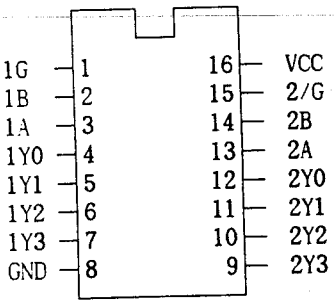


FUNCTION TABLE
(HCT541)

INPUT			OUTPUT Y
G1	G2	A	
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

* Z = High Impedance

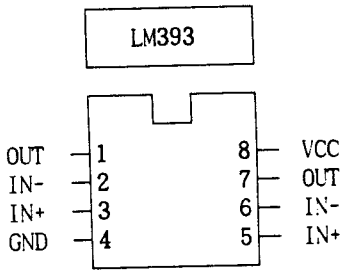
74LS139



2-TO-4-LINE DECODERS/MULTIPLEXERS

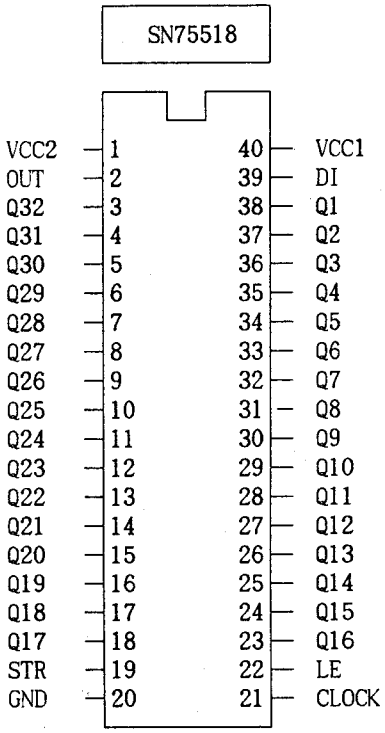
PIN NAME	PIN FUNCTION
1Y0-1Y3	DATA OUTPUTS(FIRST)
2Y0-2Y3	DATA OUTPUTS(SECOND)
1G	ENABLE(FIRST)
2G	ENABLE(SECOND)

LM393



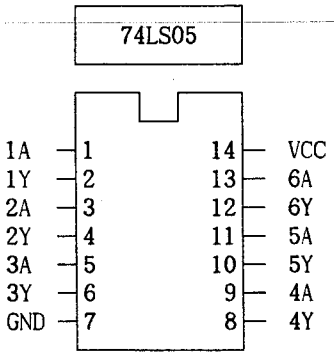
FUNCTION TABLE

INPUTS		OUTPUTS			
ENABLE G	SELECT				
	B A	Y0	Y1	Y2	Y3
H	X X	H	H	H	H
L	L L	L	H	H	H
L	L H	H	L	H	H
L	H L	H	H	L	H
L	H H	H	H	H	L



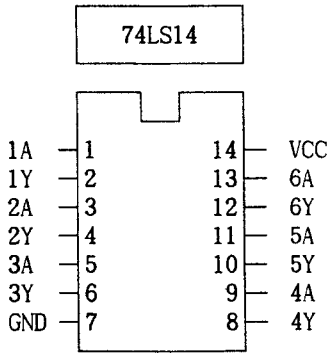
SN75518

PIN NAME	PIN FUNCTION
Q1 - Q32	DATA OUTPUTS
VCC2	+24V
VCC1	+5V
DI	DATA INPUT
LE	LATCH ENABLE
GND	GROUND
STR	STROBE
OUT	SERIAL OUT
GND	GROUND



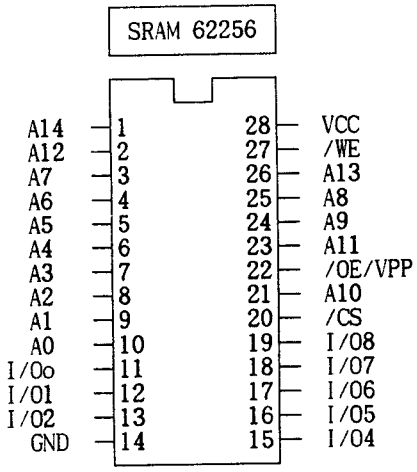
HEX INVERTED BUFFERS

PIN NAME	PIN FUNCTION
1A - 6A	INPUTS(EACH)
1Y - 6Y	INVERTED OUTPUTS



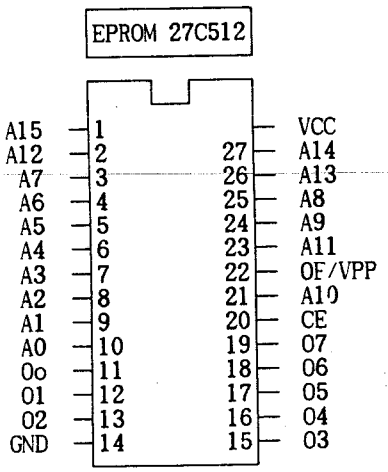
HEX SCHMITT-TRIGGER INVERTERS

PIN NAME	PIN FUNCTION
1A - 6A	INPUTS(EACH)
1Y - 6Y	INVERTED OUTPUTS



SRAM 62256 (32K X 8)

PIN NAME	PIN FUNCTION
A0 - A14	ADDRESS INPUT
I/Oo - I/07	DATA INPUT/OUTPUT
VCC	DEVICE POWER(+5V)
VSS	GROUND

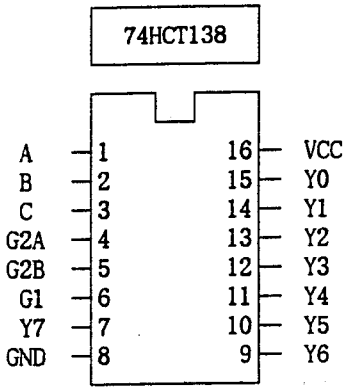


EPROM 27C512 (64K)

PIN NAME	PIN FUNCTION
A0 - A15	ADDRESS
CE	CHIP ENABLE
OE / VPP	OUTPUT ENABLE/VPP
Oo - 07	DATA INPUT/OUPUT
VCC	POWER SUPPLY (5V)
GND	GROUND
N.C	NO CONECTION

27512 27C512	27128A 27C128	2764A 27C64	2732A	2716
A15	VPP	VPP		
A12	A12	A12		
A7	A7	A7	A7	A7
A6	A6	A6	A6	A6
A5	A5	A5	A5	A5
A4	A4	A4	A4	A4
A3	A3	A3	A3	A3
A2	A2	A2	A2	A2
A1	A1	A1	A1	A1
A0	A0	A0	A0	A0
Oo	Oo	Oo	Oo	Oo
01	01	01	01	01
02	02	02	02	02
GND	GND	GND	GND	GND

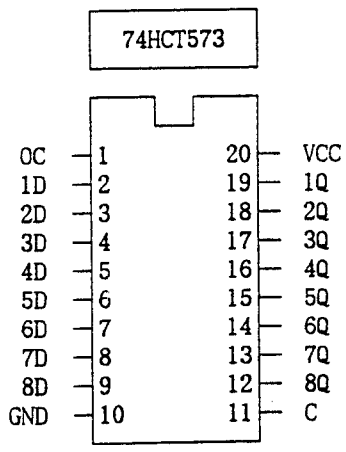
2716	2732A	2764A 27C64	27128A 27C128	27512 27C512
		VCC	VCC	VCC
		PGM	PGM	A14
VCC	VCC	NC	A13	A13
A8	A8	A8	A8	A8
A9	A9	A9	A9	A9
VPP	A11	A11	A11	A11
OE	OE/VPP	OE	OE	OE/VPP
A10	A10	A10	A10	A10
CE	CE	CE	CE	CE
07	07	07	07	07
06	06	06	06	06
05	05	05	05	05
04	04	04	04	04
03	03	03	03	03

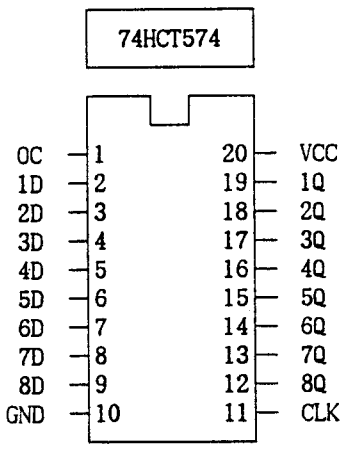


FUNCTION TABLE

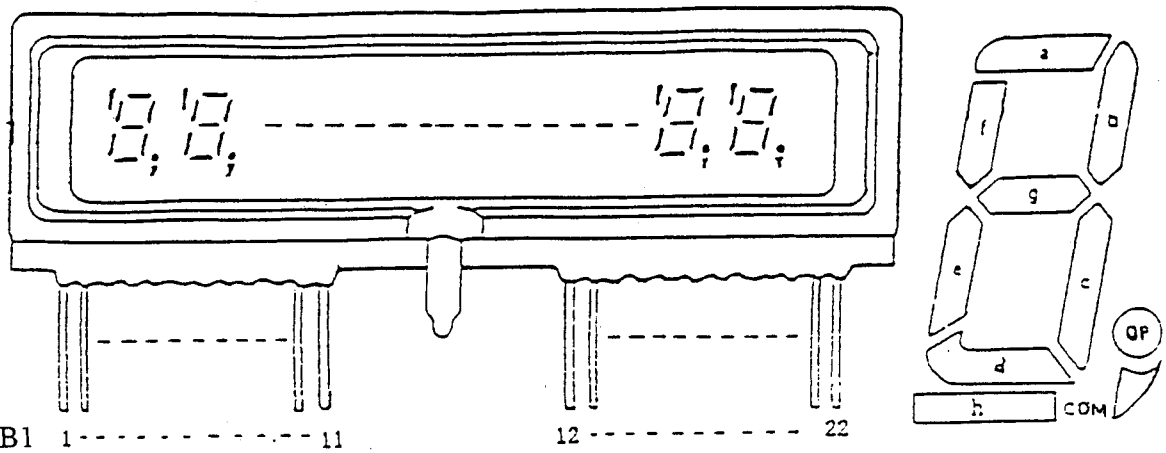
FUNCTION TABLE

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L





6-5.DIGITRON FG97D6/FG97M6/FG1010RB1



FG1010RB1 1 - - - - - - - - - - - - 11 12 - - - - - - - - - - - 22

FG97D6 1 - - - - - - - - - - - 12 13 - - - - - - - - - - - - 24

FG97M6

FG97D6 / FG97M6

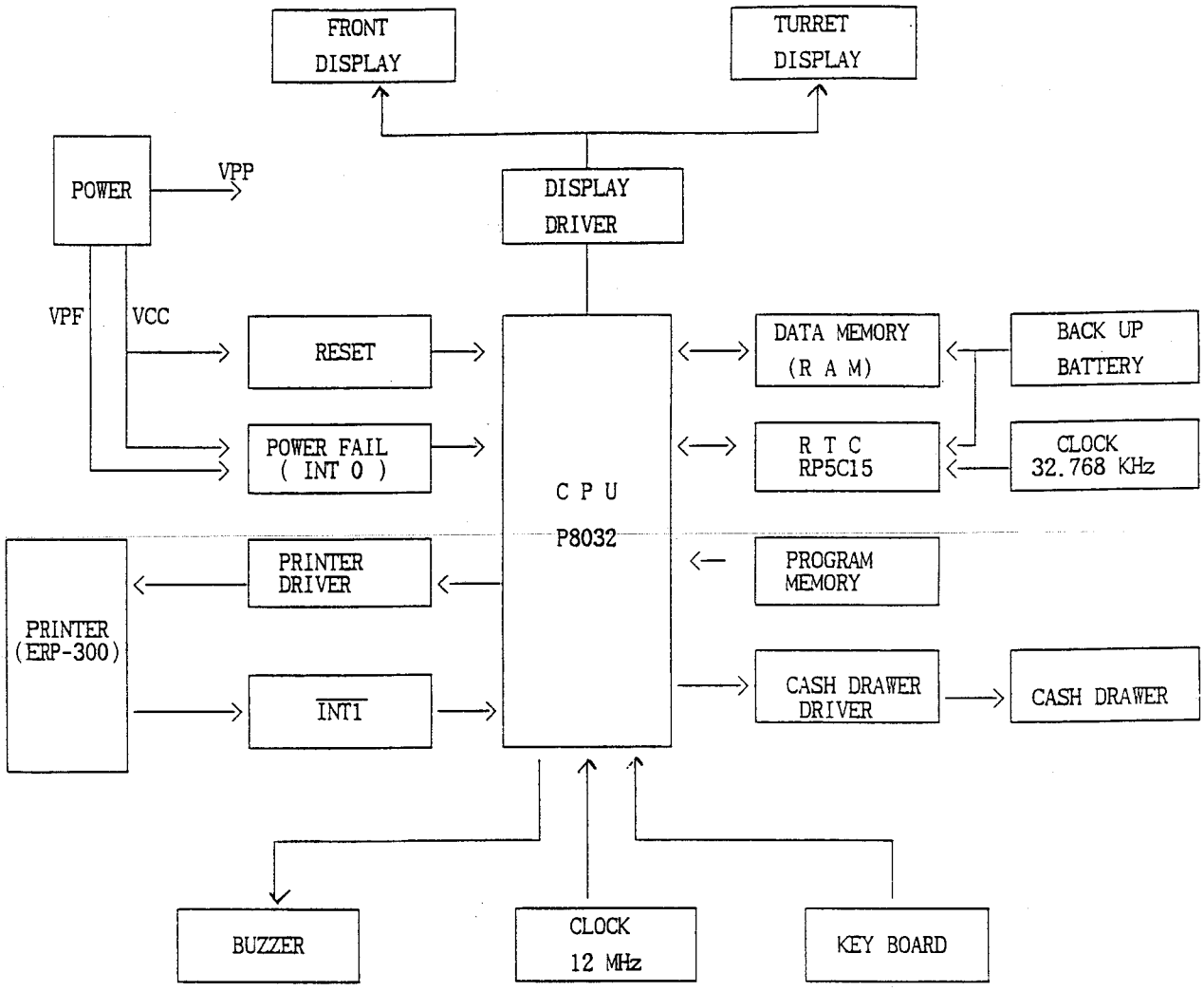
1:FILAMENT	2: PLATE(AP)	3: PLATE(f)	4: PLATE(g)
5:PLATE(e)	6: N.C.	7: N.C.	8: N.C.
9:GRID(9)	10: GRID(8)	11: GRID(7)	12: GRID(6)
13:GRID(5)	14: GRID(4)	15: GRID(3)	16: GRID(2)
17:GRID(1)	18: PLATE(COM)	19: PLATE(d)	20: PLATE(dp)
21:PLATE(c)	22: PLATE(b)	23: PLATE(a)	24: FILAMENT

FG1010RB1
PIN ASSIGNMENT

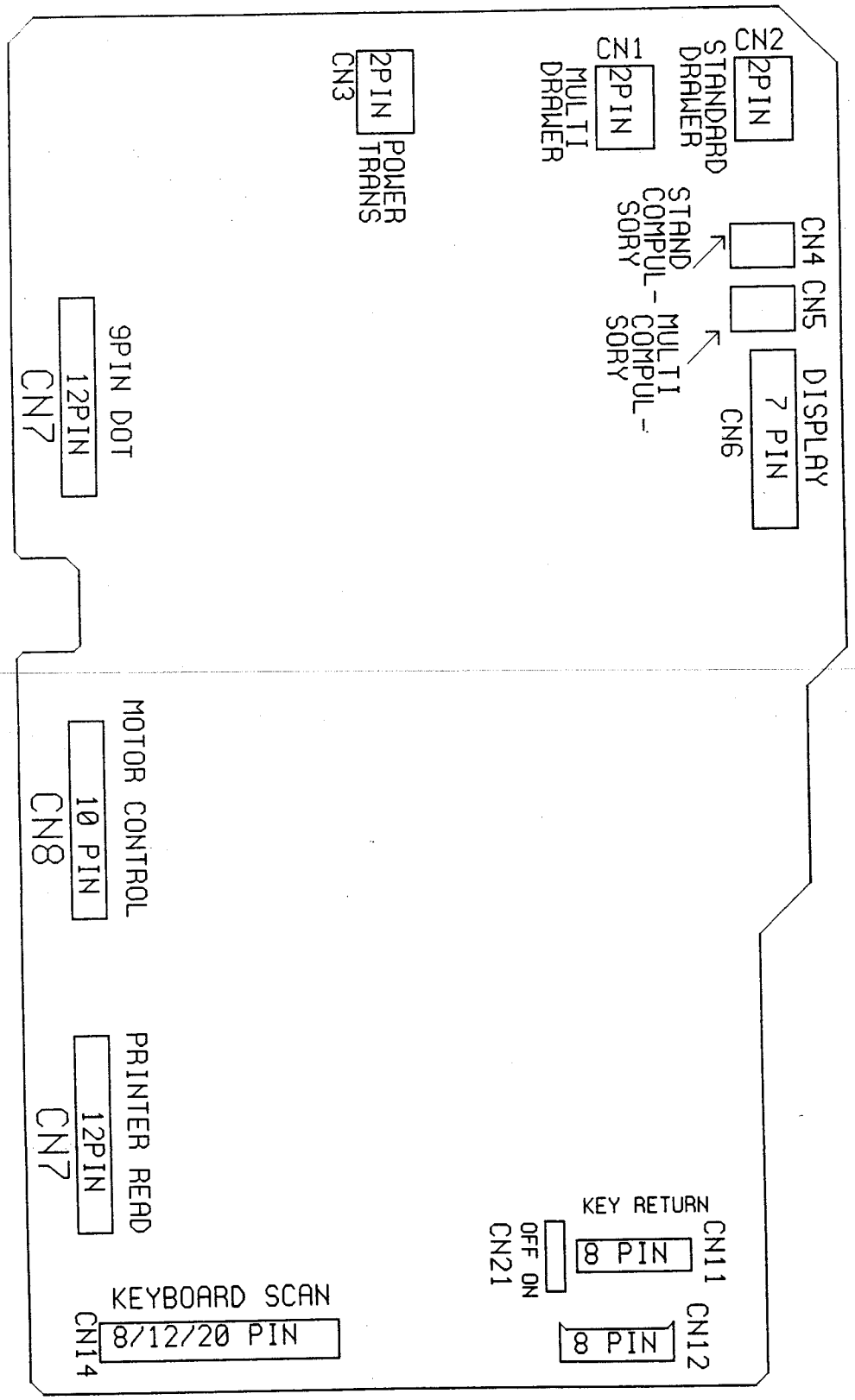
1:FILAMENT	2: PLATE(f)	3: PLATE(g)	4: PLATE(e)
5:PLATE(dp)	6: PLATE(h)	7: GRID(10)	8: GRID(9)
9:GRID(8)	10: GRID(7)	11: GRID(6)	12: GRID(5)
13:GRID(4)	14: GRID(3)	15: GRID(2)	16: GRID(1)
17:PLATE(COM)	18: PLATE(d)	19: PLATE(c)	20: PLATE(b)
21:PLATE(a)	22: FILAMENT		

7. General overview

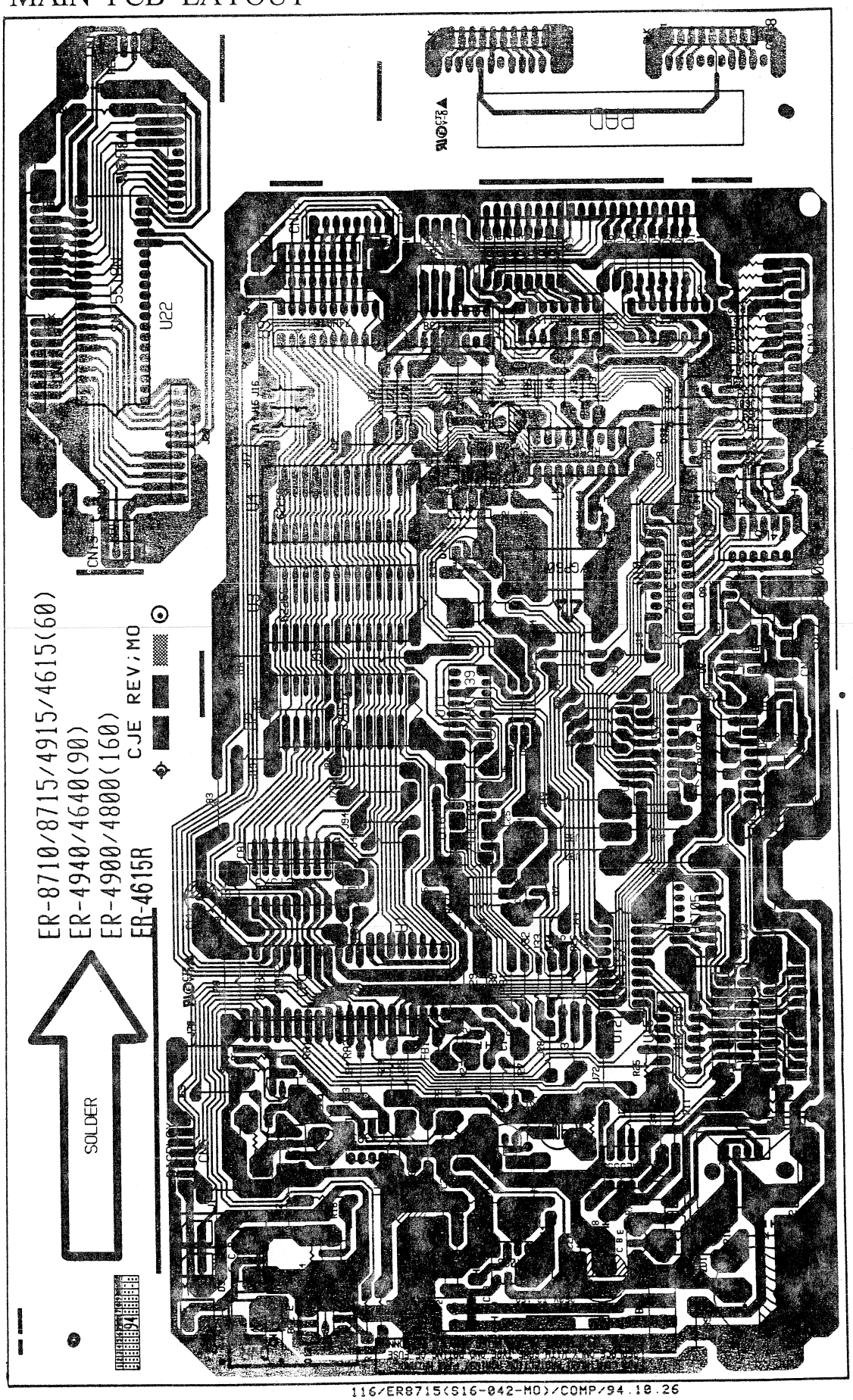
System Block Diagram

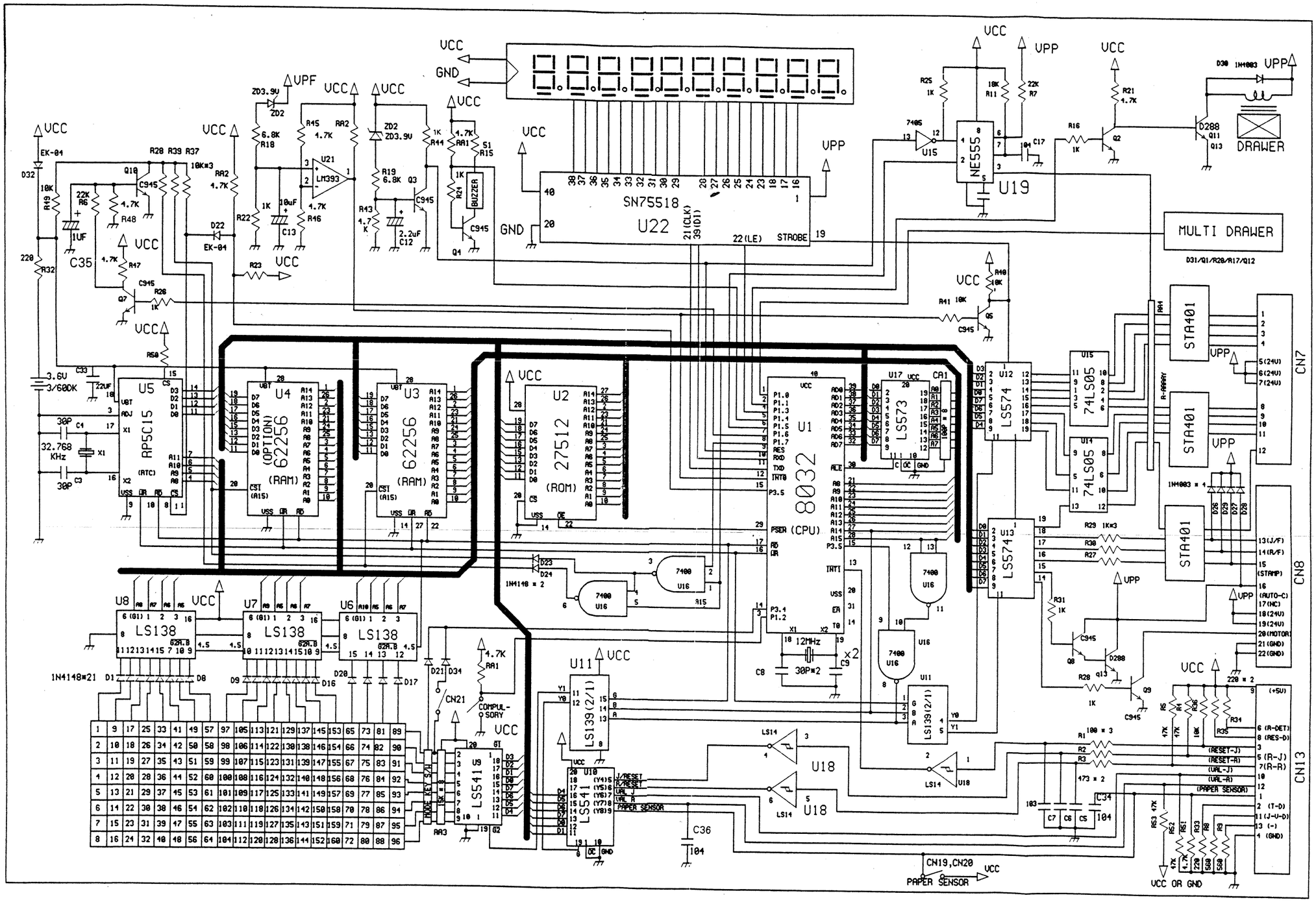


DISASSEMBLY MAIN PCB



MAIN PCB LAYOUT




SN75518
U22
U19
NE555
LM393
U21
MULTI DRAWER
D31/Q1/R28/R17/Q12
DRAWER
RP5C15
U5
(RTC)
32.768 KHz
U4
62256
(OPTION)
(RAM)
U3
(RAM)
U2
27512
(ROM)
U1
8032
(CPU)
LS573
U17
LS574
U12
LS574
U13
74LS05
U15
74LS05
U14
STA401
STA401
STA401
LS138
U8
LS138
U7
LS138
U6
LS139(2/1)
U11
LS139(2/1)
LS541
U9
LS541
U10
7400
U16
LS14
U18
LS14
U18
12MHz
X2
CN7
CN8
CN13
CN21
COMPUL-SORY
MODE KEY S/W
CN19,CN20
PAPER SENSOR
VCC OR GND
1N4148×21
1N4148 × 2
1N4003 × 4
VCC
VPP
GND

PARTS LIST

8. PART LIST

A. ASSY COVER PRINTER

LO.NO	CODE NUMBER	SPECIFICATION	Q'TY	REMARK
A1	825 139173MA	INC,BRAND-PANEL;PVC T0.3	1	
A2	821 390149AA	PLT,COVER-PRINTER;ABS(V0),T3.0	1	
A2-1	813 390019AA	IMP,CUTTER-PAPER;SUS304-CP T0.3	1	
A3	831 561002AA	COM,LOCK KEY ASS'Y;COVER-PRINTER	1	
A4	813 390024AA	IMP,CLIP-PLATE;SMP T0.5	1	
A5	821 390150AA	PLT,WINDOW-JOURNAL;ACRYL T2.0	1	

B. ASSY TURRET

B1	821 390152AB	PLT,WINDOW-TURRET;PC T3.0	1	
B2	827 159038AA	PAC,PAD-TURRET;RUBBER-SPONGE	2	
B3	895 449005AA	DISPLAY LCD	1	
B4	821 390151AA	PLT,TURRET-BODY;ABS(V0) T3.0	1	

C. ASSY UPPER

C1	825 139375PE	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4915
C1	825 139375PF	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4940
C1	825 139375PG	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4900
C1	825 139375PK	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4615
C1	825 139375PL	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4640
C1	825 139375PM	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4800
C1	825 139375SA	INC,PLATE-MODE S/W;PVC T0.3	1	ER-4615R
C2	821 390154AA	PLT,CASE-UPPER;ABS(V0) T0.3	1	
C3	842 343022AB	TAPPING,PH+,2,M3,L10;PH,+,2,M3,L10,ZPC3	2	
C4	28343-700-210	SWITCH-KEY LOCK Z;Z,5L 11110	2	
C5	28343-700-212	SWITCH-KEY LOCK C;C,5L 11112	2	
C6	933 230034KB	SWITCH-KEY LOCK,KEY-B;VD,5L 11109	2	
C7	933 230034KC	SWITCH-KEY LOCK,KEY-C;P,5L,11111	2	
C8	933 230034KE	SWITCH-KEY LOCK(REG);REG 5L 11201	2	
C9	933 230034AA	SWITCH ROTARY,10;-,12VDC,30MA,1	1	
C10	821 390153AD	PLT,WINDOW-DISPLAY;PC(LEXAN 141)	1	
C11	841 810022AA	MACHINE,SCREW,FH+,M3X60;NO,FH,+,M3,L60	1	
C12	842 840007BG	TAPPING,PH+,W,2S,M3,L10;PH,+,2,M3,L10,ZPC3,SM20C	1	

D. ASSY DISPLAY

D1	842 840009AA	TAPPING,PH+,W,2S,M3,L8;PH,+,2,M3,L8,ZPC3,SM20C	2	
D2	895 440005AA	DISPLAY LCD,10DIZ	1	
D3	813 390120AA	IMP,BRKT-DISPLAY;SBHG T1.2	1	
D4	842 840009AA	TAPPING,PH+,W,2S,M3,L8;PH,+,2,M3,L8,ZPC3,SM20C	3	

E.ASSY KEY-BOARD

E1	353 031054AAGA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4915
E1	353 031054AAHA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4940
E1	353 031054AAJA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4800/4900
E1	353 031054AAJB	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4800(EUROPE)
E1	353 031054AAJC	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4800(SPANISH)
E1	353 031054AAKA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4615
E1	353 031054AAZA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4615R
E1	353 031055AABA	KEY-BOARD ASS'Y;MEMBRANE TYPE	1	ER-4640

F.ASSY PRINTER

F1	353 033106FBAB	IMPACT DOT-PRINTER;ERP-300	1	
F2	842 840021AA	TAPPING,RH+,2S,M4,L10;RH,+,2,M4,L10,ZPC	4	
F3	821 397002AB	CUSHION-PRINTER;NR(BLACK)	4	
F4	811 390004CA	SUA,RIBBON-CASSETTE;2785FN ERC-18 PURPLE	1	

G.ASSY LOWER

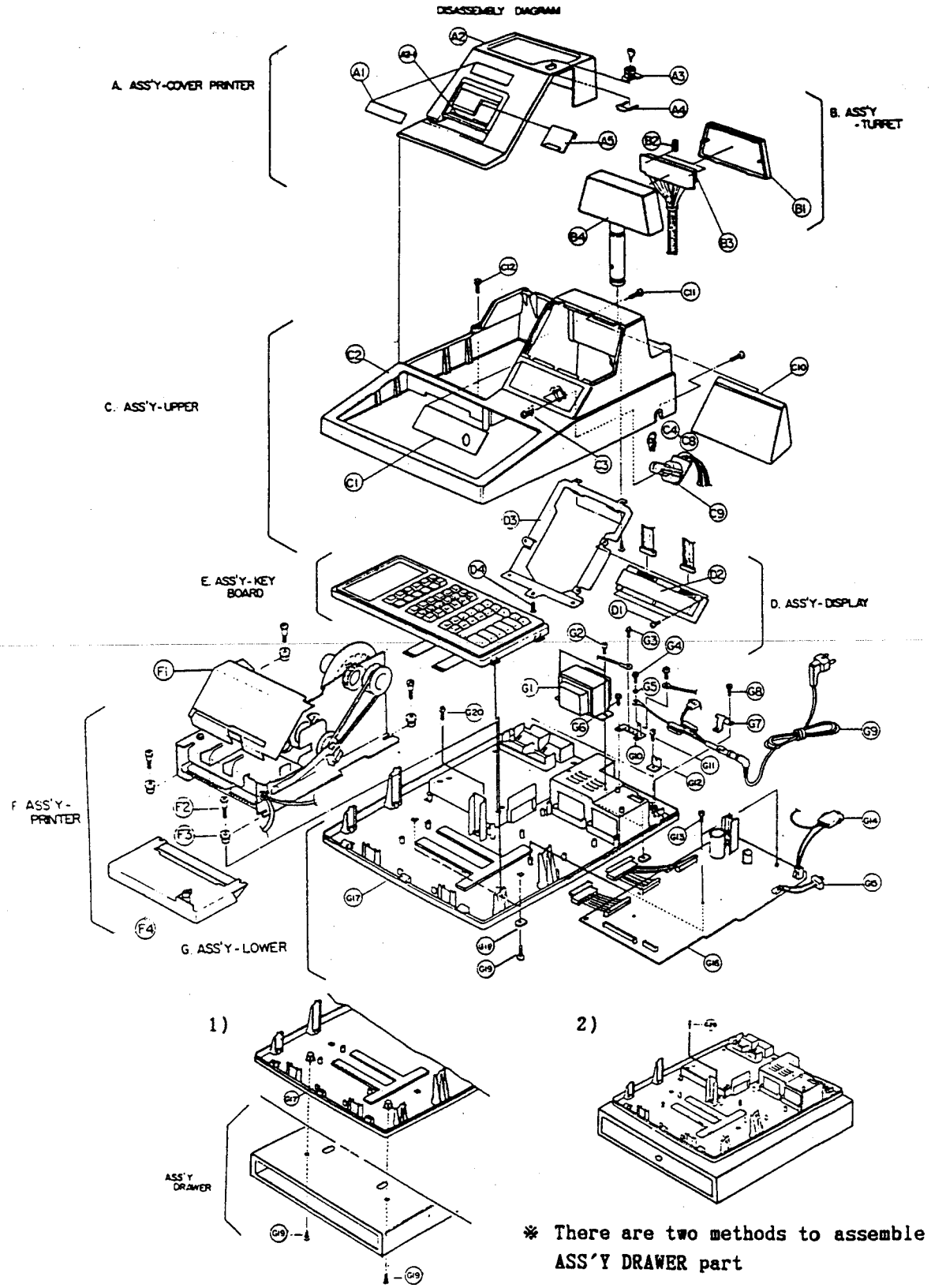
G1	923 390008AA	TRANS-POWER;P:120V,S:24V,UL	1	ER-4915/4940/4900
G1	923 390008BA	TRANS-POWER;P:230V,S,24V,TUV	1	ER-4615/4640/4800/4615R
G2	842 840030AA	TAPTITE,JOINT;BH+(S/W),M4,L10,ZN,SWRCH	2	
G3	842 840029AA	TAPPING,GROUND;RH+(OT/W),2,M3,L3,ZN,SWRCH	1	
G4	847 507003AA	TAPTITE,GROUND;BH+(OT/W),M4,L8,ZN,SWRCH	1	
G5	855 134001BB	WASHER,TOOTHED,M4,ET;M4,ID4.3,OD8.5,T0.4	1	
G6	842 840007BG	TAPPING,PH+,W,2S,M3,L10;PH+,2,M3,L10,ZPC3,SM20C	1	
G7	813 390012AA	IMP,HOLDER-CORD;SBHG1,T1.0	1	
G8	842 840009AA	TAPPING,PH+,W,2S,M3,L8;PH,+,2,M3,L8,ZPC3,SM20C	1	
G9	955 001381AAAA	CBF-POWER CORD,1600MM;DW-002(URUGUAY)	1	ER-4615/4640/4800
G9	955 001382AAAA	CBF-POWER CORD,1600MM;LTSA-3,0.75(AUSTRALIA)	1	ER-4615/4640/4800
G9	955 001384AAAA	CBF-POWER CORD,1700MM;DW-200P(USA)	1	ER-4615/4940/4900
G9	955 001385AAAA	CBF-POWER CORD,1600MM;GTBS-3,H05VV-F(NO PLUG)	1	ER-4615/4640/4800
G9	955 001416AAAA	CBF-POWER CORD,1700MM;GB13A4,H05VV-F,3GX1(U.K)	1	ER-4615/4640/4800
G9	955 001449AAAC	CBF-POWER CORD,1780MM;KKP-4819D,H05VV-F(EUROPE)	1	ER-4615/4640/4800
G10	813 390119AA	IMP,GROUND-PLATE;T1.2	1	
G11	842 344022AB	TAPPING,PH+,2,M4,L10;PH,+,2,M4,L10,ZPC3,SM20C	2	
G12	813 390013AA	IMP,BRKT-CASING;SBHG1 T1.6	2	
G13	842 840009AA	TAPPING,PH+,W,2S,M3,L8;PH,+,2,M3,L8,ZPC3,SM20C	3	
G14	955 390062AAAA	CBF-CONN ASS'Y,100MM,3P,;M-E 2103 IN	1	ER-4915/4940/4900
G14	955 390055AAAA	CBF-CONN ASS'Y,185MM,3P;SMP-03V-CBF	1	ER-4615/4640/4800
G17	821 390155AA	PLT,CASE-LOWER;ABS(V0) T3.0	1	
G18	813 390018AC	IMP,BRKT-FOOT;SCP1 T1.6	2	
G19	842 344022AB	TAPPING,PH+,2,M4,L10;PH,+,2,M4,L10,ZPC3,SM20C	2	
G20	847 501009CA	SPECIAL,TAPTITE,PH+,W,M4;S,PH,+,M4,L8,ZPC3,SWRCH18A	1	

ASSY-MAIN PCB

LO.NO	CODE NUMBER	규 격	Q'TY	비 고
	353 031066AAAA	ASS'Y MAIN PCB(ER-4915)	1	ER-4915
	353 031066AAAB	ASS'Y MAIN PCB(ER-4940)	1	ER-4940
	353 031066AAAC	ASS'Y MAIN PCB(ER-4900)	1	ER-4900
	353 031066AAAD	ASS'Y MAIN PCB(ER-4615)	1	ER-4615
	353 031066AAAE	ASS'Y MAIN PCB(ER-4640)	1	ER-4640
	353 031066AAAF	ASS'Y MAIN PCB(ER-4800)	1	ER-4800
	353 031066AAAF	ASS'Y MAIN PCB(ER-4615R)	1	ER-4615R
	22105-F83-620	IC-SRAM:HM62256BP-25(SST)	1	
	24719-006-010	BATTERY-NICAD:3/60DK	1	
	935 130049AB	BATTERY-LI,3V,950mAH	1	ER-4615R
	353 033154AABA	ASSY HEAT SINK:45 + D73	1	TR D73
	831 511011AB	COM,HEAT SINK:A6063 H45	1	
	842 840009AA	TAPPING,PH+,W,2S,M3,L8:PH	1	
	891 490073AA	TR-NPN,KSD73,TO-220:	1	Q14
	821 397027AA	PLT,PAD-DIGITRON:RUBBER S	2	PCB
	825 119334BA	INC,LABEL SERIAL:8.5*26.5	1	PCB
	825 119491AA	INC,ROM PROTECTOR:ART,12X	1	EPROM
	873 275518AA	IC-MOS,75518,DRIVER:DIP,4	1	U22
	877 108032AA	IC-MPU,8032,PROCESSOR:DIP	1	U1
	881 200393AAND	IC-LIN,393,COMPARATOR:DIP	1	U21
	881 334063AA	IC-LIN,34063,CONV.CONTRO:	1	U20
	881 800401UA	IC-LIN,401,TR ARRAY:SIP,1	3	TA1,TA2,TA3
	881 900555AAND	IC-LIN,555,TIMING CKT.:DI	1	U19
	883 627512BAND	IC-MEM,EPROM,27512,64KX8:	1	U2
	887 135102SH	IC-HYB,R-NETWORK,10P:SIP,	1	RA4
	887 135153SG	IC-HYB,R-NETWORK,9P:SIP,9	1	RA3
	887 135472SGSA	IC-HYB,R-NETWORK,9P:SIP,9	2	RA1,RA2
	887 200013SA	IC-HYB,C-NETWORK,9P:SIP,9	1	CA1
	891 490288BCNA	(S)TR-NPN,KSD288-Y,TO-220	1	Q11
	893 290032AC	DIODE-ZEN,UZP-24B,DO-41:1	1	ZD1
	893 315822AAND	DIODE-REC,1N5822,DO-210A:	1	D33
	893 399062AA	DIODE-REC,FM202,-:200V,-,	1	B.D2
	911 603307GB	REF-WW,0.33,5%,1W:-,-400	1	R14
	917 123100LM	CAP-AL.ELEC,107M,2A:(T)10	2	C10,C15
	917 844470HM	CAP-AL.ELE,478M,1H,22X40:	1	C15
	925 480005BA	COIL-CHOKE,140UH:TR-15,0.	1	L1
	935 144108AANA	CON-FLAT CABLE,8P,2.54:ST	1	CN12
	935 144112AANB	CON-FLAT CABLE,12P,2.54:S	1	CN14
	935 155128DC	CON-IC SOCKET,28P:DIP,STR	1	U2
	935 240102DA	CON-BOX HEADER,2P,2.5MM:1	4	CN4/CN5/CN19/CN20
	935 240107DA	CON-BOX HEADER,7P,2.5MM:1	1	CN6
	935 240108DA	CON-BOX HEADER,8P,2.5MM:1	1	CN11
	935 240109DA	CON-BOX HEADER,9P,2.5MM:1	1	CN17
	935 240110DA	CON-BOX HEADER,10P,2.5MM:	1	CN9
	935 240902DF	CON-WALL HEADER,2P,3.96MM	2	CN2,3
	935 355102DBNG	CON-SHUNT,2P,-,	1	CN21
	939 010031AA	AUDIO-BUZZER:-,-,-,-,	1	
	941 110067UBNA	CRYSTAL,12M,50:HC-18/U,-,	1	X2
	941 110073AA	CRYSTAL,32.768K,20:DT-38,	1	X1
	949 115202SLNA	FUSE-GLASS TUBE,3,125:SLO	1	
	955 390058AAAB	CBF-CONN ASSY,370MM,10P:5	1	CN10
	955 390060AAAA	CBF-CONN ASSY,370MM,09P:5	1	CN18
	955 390082AAAA	CBF-CONN ASSY,220MM,13P:H	1	CN13
	955 390083ABAA	CBF-CONN ASSY,210/230MM,2	1	CN7,CN8
	955 390084ABAA	CBF-CONN ASSY,380MM,7P:52	1	CN6

ASSY MAIN AUTO

LO.NO	CODE NUMBER	규 격	Q'TY	비 고
	02169-201-077	DIODE:1N4003(T)	4	D26/27/29/30
	871 760005AANF	IC-TTL,74LS05,INVERTER:DIP	2	U14,U15
	871 760014AANB	IC-MOS,74LS14,INVERTER:DIP	1	U18
	873 790000AB	IC-MOS,74HCT00,GATE:DIP	1	U16
	873 790138AC	IC-MOS,74HCT138,DECODER:DIP	2	U6,U8
	873 790139AC	IC-MOS,74HCT139,DECODER:DIP	1	U11
	873 790541AC	IC-MOS,74HCT541,BUFFER:DIP	2	U9,U10
	873 790573AC	IC-MOS,74HCT573,LATCH:DIP	1	U17
	873 790574AC	IC-MOS,74HCT574,LATCH:DIP	2	U12,U13
	881 700515AA	IC-LIN,5C15,TIME CLOCK:DIP	1	U5
	891 390006XA	TR-NPN,KSC945,TO-92:0.25W	8	Q2~Q7/Q9/Q10
	893 114148AANA	DIODE-SIG,1N4148,DO-35:75	17	D1~D8/D17~D25
	893 290031EB	DIODE-ZEN,UZ-3.9B,DO-35:	1	ZD2
	893 399060AA	DIODE-REC,EK-04,DO-41:40V	1	D32
	911 125107DA	REF-CF,51,5%,1/4W:250V,-3	1	R15
	911 131007DA	REF-CF,100,5%,1/4W:250V,-	3	R1,R2,R3
	911 132207DA	REF-CF,220,5%,1/4W:250V,-	4	R32~R35
	911 133307DA	REF-CF,330,5%,1/4W:250V,-	2	R20,R21
	911 135607DA	REF-CF,560,5%,1/4W:250V,-	3	R8,R9,R28
	911 138207DA	REF-CF,820,5%,1/4W:250V,-	1	R10
	911 141007DA	REF-CF,1K,5%,1/4W:250V,-3	11	R16/17/R22~R27/29~31
	911 144707DA	REF-CF,4.7K,5%,1/4W:250V,	11	R43~R53
	911 146807DA	REF-CF,6.8K,5%,1/4W:250V,	2	R18,R19
	911 151007DA	REF-CF,10K,5%,1/4W:250V,-	7	R36~R42
	911 151807DA	REF-CF,18K,5%,1/4W:250V,-	1	R11
	911 152007DA	REF-CF,20K,5%,1/4W:250V,-	1	R6
	911 152207DA	REF-CF,22K,5%,1/4W:250V,-	1	R7
	911 154707DA	REF-CF,47K,5%,1/4W:250V,-	2	R4,R5
	911 451205DA	REF-MF,12K,1%,1/4W:250V,-	1	R12
	911 453605DB	REF-MF,36K,1%,1/4W:250V,-	1	R13
	915 312300HJHH	CAP-CERAMIC,300J,1H,SL:30	4	C1 ~ C4
	915 323470HKPH	CAP-CERAMIC,471K,1H,Y5P:4	1	C8
	915 325100HZVH	CAP-CERAMIC,103Z,1H,Y5V:1	1	C7
	915 325470HZVH	CAP-CERAMIC,473Z,1H,Y5V:4	2	C5,C6
	915 336100HZVH	CAP-CERAMIC,104Z,1H,Y5V:1	14	C16/C20~C32
	916 166100HJAH	CAP-MYLAR,104J,1H,5P:100N	3	C17,C18,C19
	917 121220HM	CAP-AL.ELEC,225M,1H:(T)50	1	C12
	917 122220HM	CAP-AL.ELEC,226M,1H:(T)50	1	C13
	917 123100CM	CAP-AL.ELEC,107M,1C:(T)16	2	C11,C14
	937 120204BA	MAG-CORE,FERRITE,BEAD:BEA	6	FB1~FB4,FB6,FB7
	937 120208AA	MAG-CORE,FERRITE,BEAD:BEA	2	FB5,FB8
	947 390002AB	PWB-MAIN,ER-3715D,1LAYER:	1	
	955 005001AAAB	CBF-JUMPER WIRE,52MM:TAPP	94	J1 ~ J93,J95



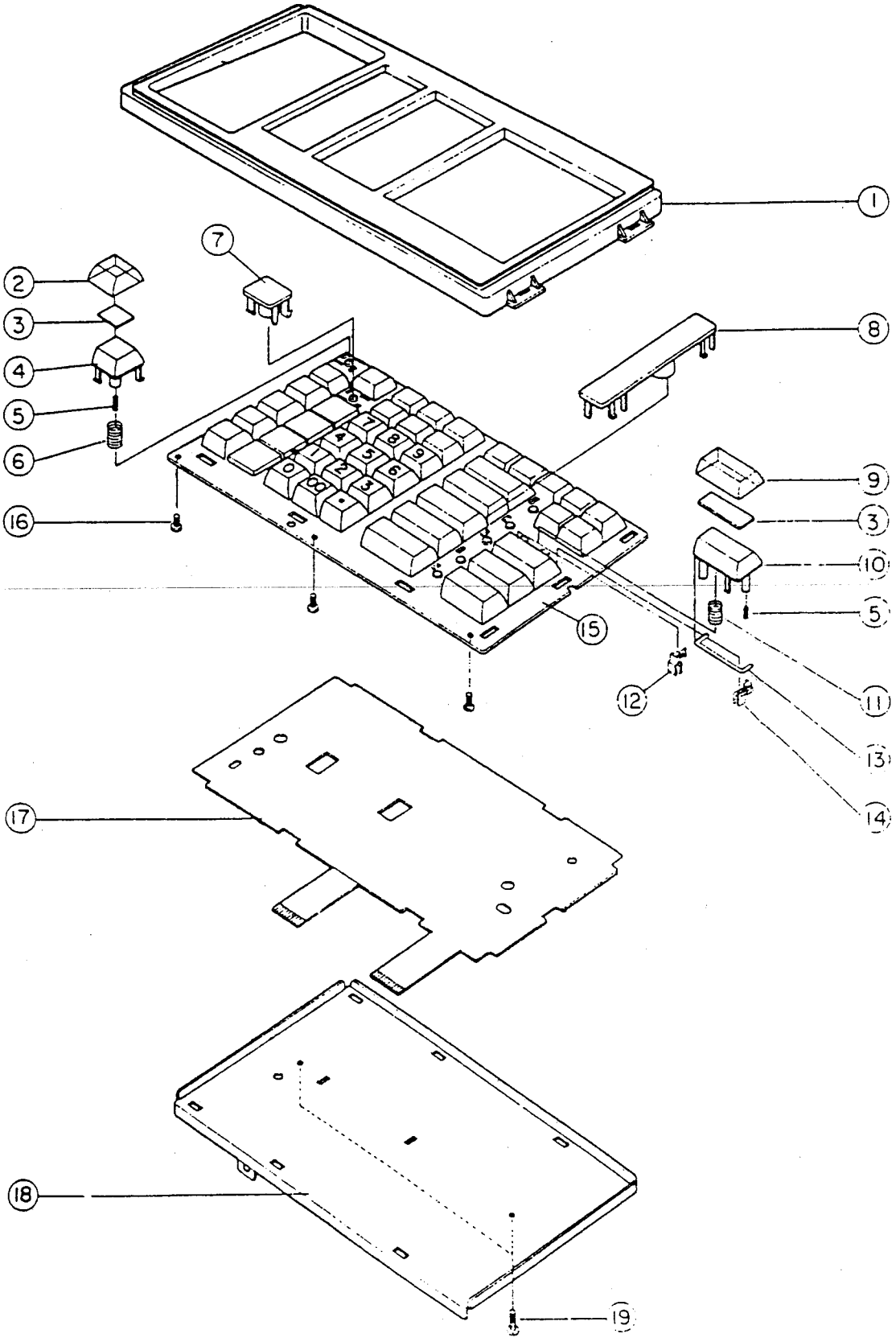
※ There are two methods to assemble ASS'Y DRAWER part

NO	LO. NO	CODE NUMBER	DESCRIPTION/SPECIFICATION	Q'TY	REMARK
1)	G19	842 444022AB	TAPPING, RH+, 2S, M4, L10 ; RH, +, 2, M4, ZPC	2	
2)	G20	847 501009CA	SPECIAL, TAPTITE, PH+, W, M4	1	

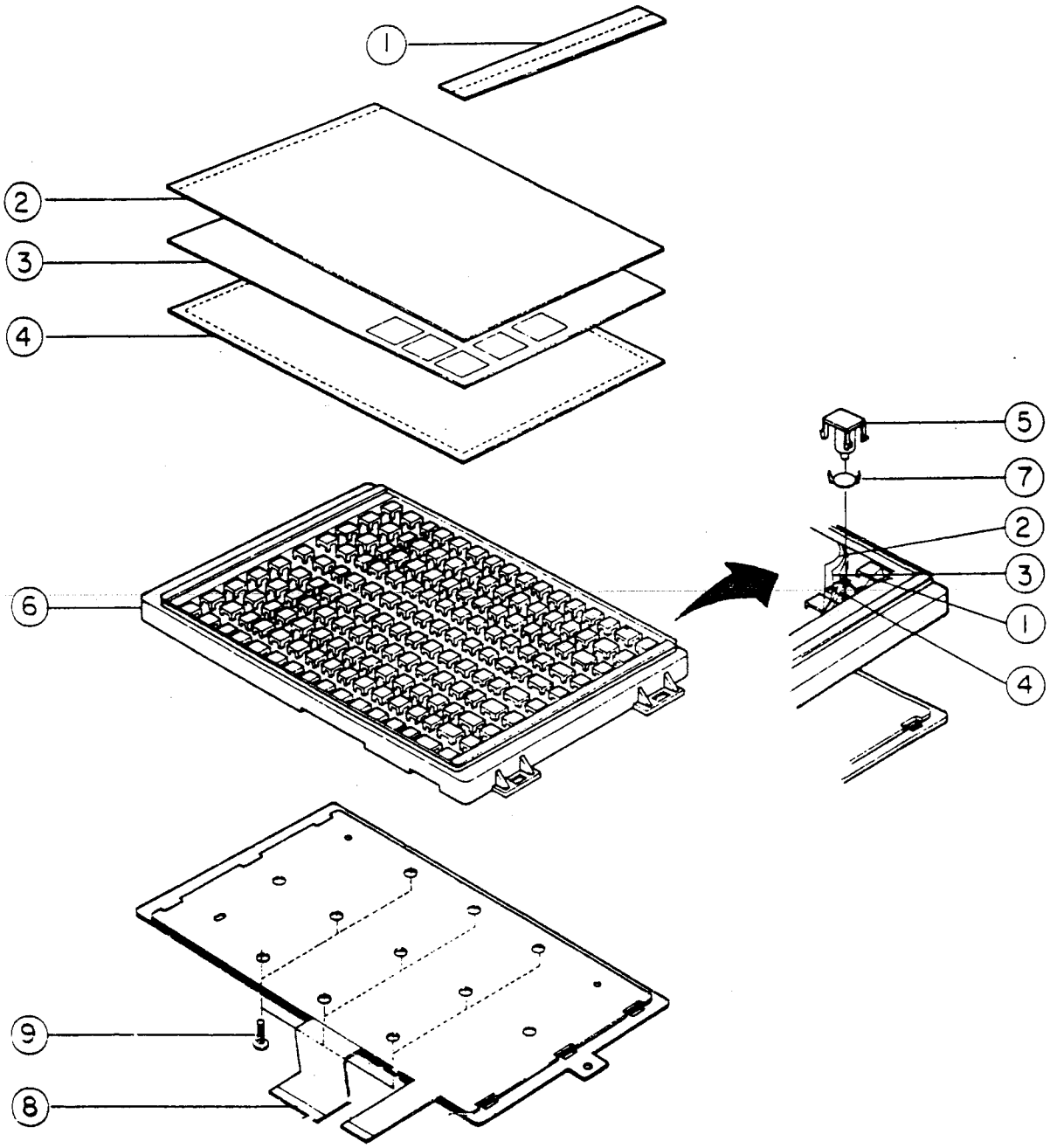
ASSY KEY-BOARD (MEMBRANE TYPE:60KEY/90KEY)

LO.NO	CODE NUMBER	DESCRIPTION/SPECIFICATIONS	Q'TY	REMARKS
1	821 390156AA	PLT,KBD-HOUSING:ABS(V0)-60KEY	1	
1	821 390157AA	PLT,KBD-HOUSING:ABS(V0)-90KEY	1	
2	27624-702-110	KEY-CAP S:PC 1*1(S-Z0513-71 #01)	0	
3	825 119331KA	INC,LABEL-KEY TOP SET:MOJO 100GR	1	
4	27623-701-310	KEY-TOP S:ABS 1*1(302KAS-014-01)	1	
5	26674-710-810	COIL-SPRING:SUS CONTACT(601KAS-001-01)	1	
6	26674-710-610	COIL-SPRING:SWPA RETURN 1*1U(601KAS)	1	
9	27624-702-210	KEY-CAP L:PC 1*2(S-Z0513-75 #01)	1	
10	821 390160AA	PLT,KEY-TOP(1*2);302 KAS-032-00,ABS	1	
11	831 522056AA	COM,COIL-SPRING RETURN,1*2	1	
12	821 390158AA	PLT,HOOK-A;541KAS-001-01 ,POM	1	
13	813 390124AA	IMP,SPACE-BAR:321KAS-019-90,SUS 304	1	
13	813 390124AA	IMP,SPACE-BAR:321KAS-019-90,SUS 304	11	
13	813 390124AA	IMP,SPACE-BAR:321KAS-019-90,SUS 304	6	
14	821 390158BA	PLT,HOOK-B;541KAS-002-01 ,POM	9	
15	821 390139AA	PLT,FRAME:POM T1.6	1	
15	821 390144AA	PLT,FRAME:POM T1.6	1	
16	842 840009AA	TAPPING PH,W,2S,M3,L8,PH,L8,ZPC3,SM20C	8	
17	353 033055AAAA	FPC-ASSY	1	
17	821 390140AA	PLT,FPC-A	1	
17	821 390141AA	PLT,FPC-B	1	
17	353 033055AAAC	FPC-ASSY	1	
17	821 390140BA	PLT,FPC-A:PETP T0.125	1	
17	821 390141BA	PLT,FPC-B:PETP T0.125	1	
18	813 390121AA	IMP,BASE-PLATE:SECC T0.8	1	
18	813 390122AA	IMP,BASE-PLATE:SECC T0.8	1	
	23554-701-410	SWITCH-KEY TOP 0:ABS(302KAS-019-05)	1	
	23554-701-010	SWITCH-KEY TOP 00:ABS(302KAS-017-31)	1	
	23554-701-110	SWITCH-KEY TOP .:ABS(302KAS-017-32)	1	
	23554-700-210	SWITCH-KEY TOP 1:ABS(302KAS-017-21)	1	
	23554-700-310	SWITCH-KEY TOP 2:ABS(302KAS-017-22)	1	
	23554-700-410	SWITCH-KEY TOP 3:ABS(302KAS-017-23)	1	
	23554-700-510	SWITCH-KEY TOP 4:ABS(302KAS-017-24)	1	
	23554-701-310	SWITCH-KEY TOP 5:ABS(302KAS-018-05)	1	
	23554-700-610	SWITCH-KEY TOP 6:ABS(302KAS-017-26)	1	
	23554-700-710	SWITCH-KEY TOP 7:ABS(302KAS-017-27)	1	
	23554-700-810	SWITCH-KEY TOP 8:ABS(302KAS-017-28)	1	
	23554-700-910	SWITCH-KEY TOP 9:ABS(302KAS-017-29)	1	
	842 840009AA	TAPPING,PH+,W,2S,M3,L8:PH,+,2,M3,L8	8	
19	842 343022AB	TAPPING,PH+,2,M3,PH+,L10,PH,ZPC3,SM20C	2	

ASS'Y Keyboard Disassembly : membrane type



ASS'Y Keyboard Disassembly : flat type



DRAWER

A.ASSY-BILL COIN

LO.NO	CODE NUMBER	DESCRIPTION/SPECIFICATIONS	Q'TY	REMARKS
A	2D902-701-077	ASSY BILL COIN	1	
A1	821 390002AA	PLT,LEVER PRESS:ACETAL,BLK	4	
A2	831 521006AA	COM,SPRING-LEVER PRESS:SUS-WH PI0.3	4	
A3	813 390014AA	PLT,HOLDER-PRESS,ACETAL,BLK	4	
A4	841 613008BB	MACHINE,SCREW,BH+,M3X6:NO,BH,+,M3,L6,ZP	3	
A5	842 343008AB	TAPPING,PH+,2,M3,L6:PH,+,2,M3,L6,ZPC3,S	4	
A6	813 390002AA	IMP HOLDER-PLATE:SBHG T1.2	1	
A7	821 390005AA	PLT,PARTETION-BILL:HIPS(HB)	3	

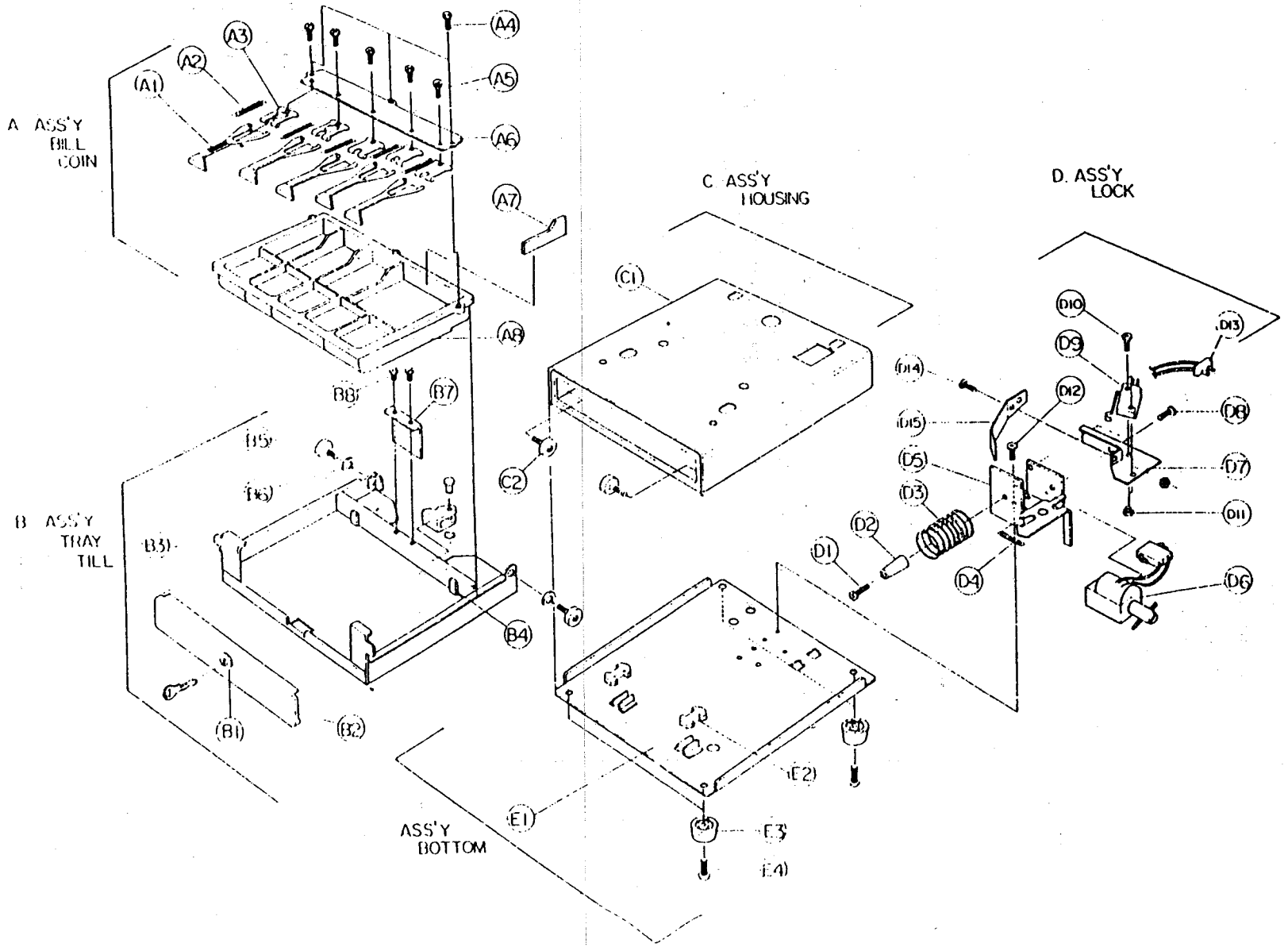
B.ASSY-TRAY TILL

B	2D902-701-051	ASSY TRAY	1	
B1	831 561002AB	COM,LOCK KEY ASSY	1	
B2	813 390036AA	IMP,PANEL-FRONT:SBC1 T1.0	1	
B3	2D903-701-076	ASSY-SUB TRAY	1	
	813 390025AA	IMP,SUPPORT-TRAY BRACKET:SBHG-1 T1.2	1	
	813 390034AA	IMP,TRAY-TILL:SBHG-1 T1.2	1	
	813 390053AA	IMP,BRACKET-SHAFT LOCK:SBHG-1 T1.5	1	
	813 390055AA	IMP,SUPPORT-TRAY:SBHG-1 T1.2	1	
	813 390056AA	IMP,SUPPORT-PANEL LH:SBHG-1 T1.5	1	
	813 390057AA	IMP,SUPPORT-PANEL RH:SBHG-1 T1.5	1	
	853 126001BB	NUT,HEX,2-M6:HEX,2,M6,-,ZPC3,SM20C,	1	
B4	821 390062AA	PLT,SPONGE-TENSION:SPONGE(ERD-550)	2	
B5	813 390096AA	IMP,ROLLER:DR-19-B1 PI19	2	
B6	27308-203-001	PLAIN WASHER	2	
B8	841 514013BB	MACHINE SCREW,TH+,M4*8	2	
	813 395000AA	IMP,SHAFT-LOCK:S45C PI5.0	1	
	841 213008BC	MACHINE,SCREW,FH+,M3X6:NO,FH,+,M3,L6,BL	1	
	857 150008AG	MISCEL,RING,E,ID3,#3:ID3,OD7,T0.6,BLACK	1	

C.ASSY-HOUSING

C1	2D903-701-051	ASSY-SUB HOUSING	1	
	813 390007AA	IMP,HOUSING:SBC-1 T1.0 DRAK BROWN	1	
	813 390031AA	IMP,CHANNEL-LH:SBC-1 T1.6 DARK BROWN PI	1	
	813 390032AA	IMP,CHANNEL-RH:SBC-1 T1.6 DARK BROWN PI	1	
	813 390037AA	IMP,FRONT-PLATE:SBC-1 T1.0 DARK BROWN P	1	
	813 390038AA	IMP,REAR-PLATE:SBC-1 T1.0 DARK BROWN PI	1	
	813 390058AA	IMP,SUPPORT-CHANEL:SBC-1 T1.2 DARK BROW	1	
C2	813 390096AA	IMP,ROLLER: DR-19-B1 P119	2	

(DRAWER DISASSEMBLY DIAGRAM)

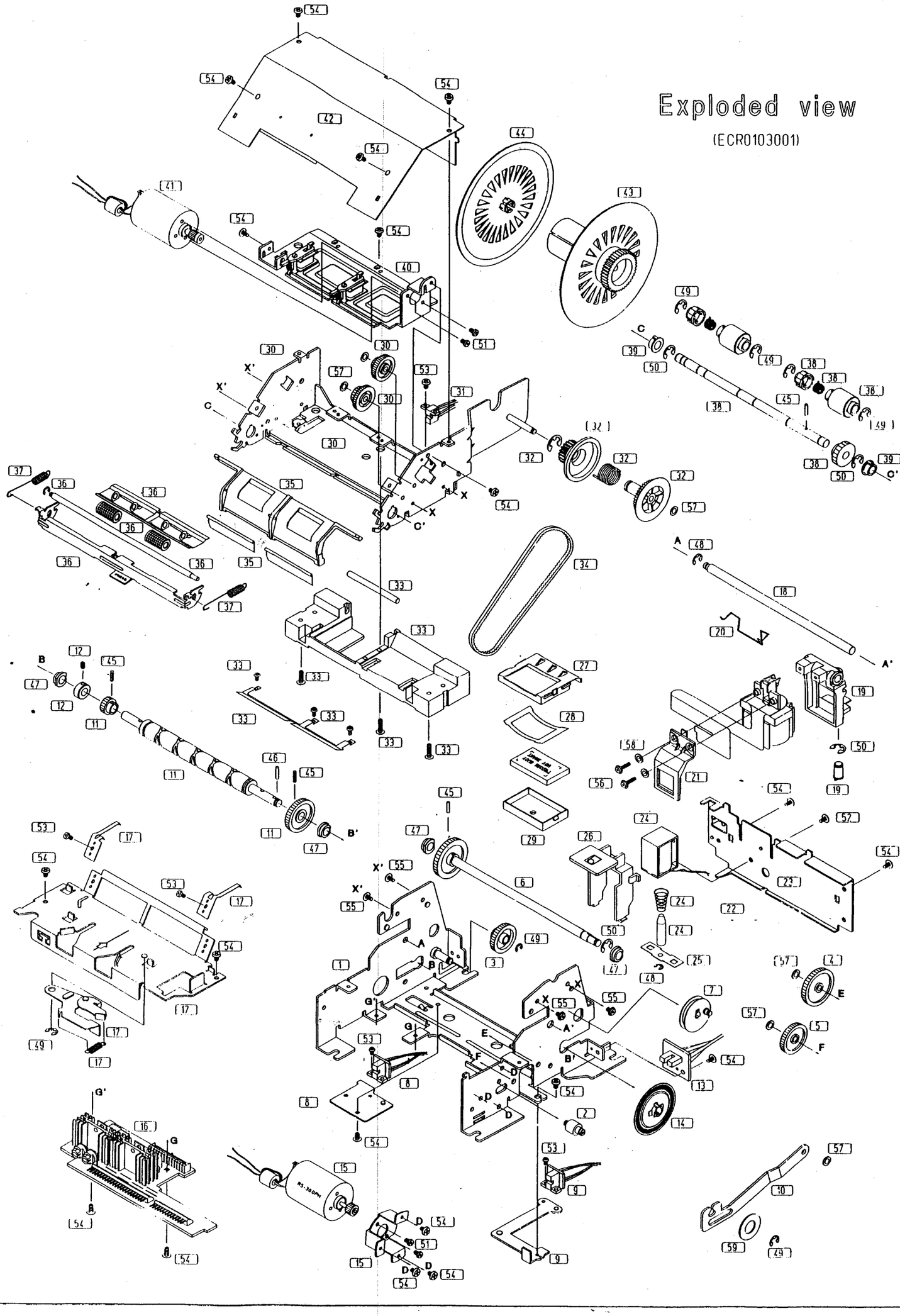


PRINTER ERP-300V

LO.NO	SEC CODE	DESCRIPTION/SPECIFICATION	REMARK
	353 033106FBAD	IMPACT DOT PRINTER : ERP-300V	
	S09-15E	HEAD ASS'Y:69828-16001AA,A/S	HEAD 9 PIN ASS'Y
1	996 139002GZ	MAIN FRAME CAULKING ASS'Y,ECR01-210,A/S	
2	996 139002AG	SHAFT LEVER SUPPORT:18634-00060EA,A/S	
3	996 139002AL	GEAR REDUCTION_2:18613-01050AB,A/S	
4	996 139002AU	GEAR HEAD IDLE_2:18613-01020AB,A/S	
5	996 139002AT	GEAR HEAD IDLE_1:18613-01010AB,A/S	
6	996 139002HA	GEAR REDUCTION_3 ASS'Y,ECR01-220,A/S	
7	996 139002HB	ROLLING CAM ASS'Y,ECR01-121 ,A/S	
8	996 139002HC	R-RESET SENSOR ASS'Y,ECR01-440,A/S	
9	996 139002HD	J-RESET SENSOR ASS'Y,ECR01-430,A/S	
10	996 139002FJ	RIBBON DRIVING LEVER:18607-01000AA,A/S	
11	996 139002HE	LEAD CAM ASS'Y,ECR01-230,A/S	
12	996 139002HF	AD_BUSH ASS'Y,ECR01-450 ,A/S	
13	996 139002HG	ENCODER SENSOR ASS'Y,ECR01-400,A/S	
14	996 139002CF	ENCODER:18614-01000AB,A/S	
15	996 139002HH	HEAD MOTOR ASS'Y,ECR01-340,A/S	
16	996 139002HJ	MAIN PCB ASSEMBLY,ECR01-320,A/S	
17	996 139002HK	RIBBON FRAME ASS'Y,ECR01-380,A/S	
18	996 139002HL	SHAFT HEAD GUIDE,_18634-00030EA,A/S	
19	996 139002HM	HEAD CARRIAGE ASS'Y,ECR02-370,A/S	
20	996 139002BA	SPRING CARRIAGE LOAD:51298-09406XA,A/S	
21	996 139002BH	HEAD COVER:18604-01020AB,A/S	
22	996 139002HP	BACK COVER ASS'Y,ECR01-141,A/S	
23	996 139002HQ	BACK COVER ,18604-01000AA,A/S	
24	996 139002HR	SOLENOID STAMP ASS'Y,ECR02-450,A/S	
25	996 139002EE	STAMP SPRING:18611-01010AA,A/S	
26	996 139002HS	STAMP PUSHER,18618-01000AB,A/S	
27	996 139002FM	STAMP COVER:18604-01030AB,A/S	
28	996 139002FN	PLATE STAMP SPRING:18611-01000AA,A/S	
29	996 139002FP	STAMP CASE:18615-01000AB,A/S	
30	996 139002HT	UPPER FRAME ASS'Y,ECR01-111,A/S	
31	996 139002HU	VALIDATION SENSOR ASS'Y,ECR01-420,A/S	
32	996 139002HV	PAPER ROLLING ASS'Y,ECR01-370,A/S	
33	996 139002HW	STAMP PAPER GUIDE ASS'Y,ECR02-240,A/S	
34	996 139002DY	TIMING BELT:51423-07122XA,A/S	
35	996 139002HY	PAPER GUIDE ASS'Y,ECR01-191,A/S	
36	996 139002HZ	RELEASE LEVER ASS'Y,ECR01-151,A/S	
37	996 139002ER	SPRING RELEASE:51222-06053XA,A/S	
38	996 139002JA	PAPER FEED SHAFT ASS'Y,ECR01-330,A/S	
39	996 139002FT	POLY BEARING:51602-06000AA,A/S	
40	996 139002JB	MOTOR FEEDING BRACKET ASS'Y,ECR01-300,A/S	
41	996 139002JC	PAPER MOTOR ASS'Y,ECR01-350 ,A/S	
42	996 139002JD	COVER_1 ASS'Y,ECR01-161,A/S	
43	996 139002JE	SPOOL ASS'Y,ECR01-181,A/S	
44	996 139002JF	DISK ,18628-01000AB,A/S	
45	996 139002JG	SP(PI 2X10) ,52062-01000QA,A/S	
46	996 139002GQ	PARALLEL PIN (2 X 10):52015-01000XA,A/S	
47	996 139002FR	OILESS METAL-1:51601-06000AA,A/S	
48	996 139002GK	E-RING (RE 3.0) :51855-03006XA,A/S	
49	996 139002GL	E-RING (RE 4.0) :51855-04006XA,A/S	
50	996 139002GM	E-RING (RE 5.0) :51855-05006XA,A/S	
51	996 139002JH	SCREW(PS 2.6X4),50032-26041EA,A/S	
52	996 139002FW	SCREW(PH 3X4):50032-30041EA,A/S	
53	996 139002GD	SCREW(T/T PH 3X4):50232-30049EA,A/S	
54	996 139002JJ	SCREW(T/T PH 3 X 5),50232-30059EA,A/S	
55	996 139002JK	SCREW(CP 3 X 6) ,50032-30061EC,A/S	
56	996 139002JL	SCREW(T/P PH 3X10),50232-30104EA,A/S	
57	996 139002GF	PSW(3.6 X6.0 X 0.5):51001-03605XA,A/S	
58	996 139002GG	PW(3 X 7):51002-03006EA,A/S	
59	996 139002GH	PW(5 X 10 X 1.0):51002-05010EB,A/S	

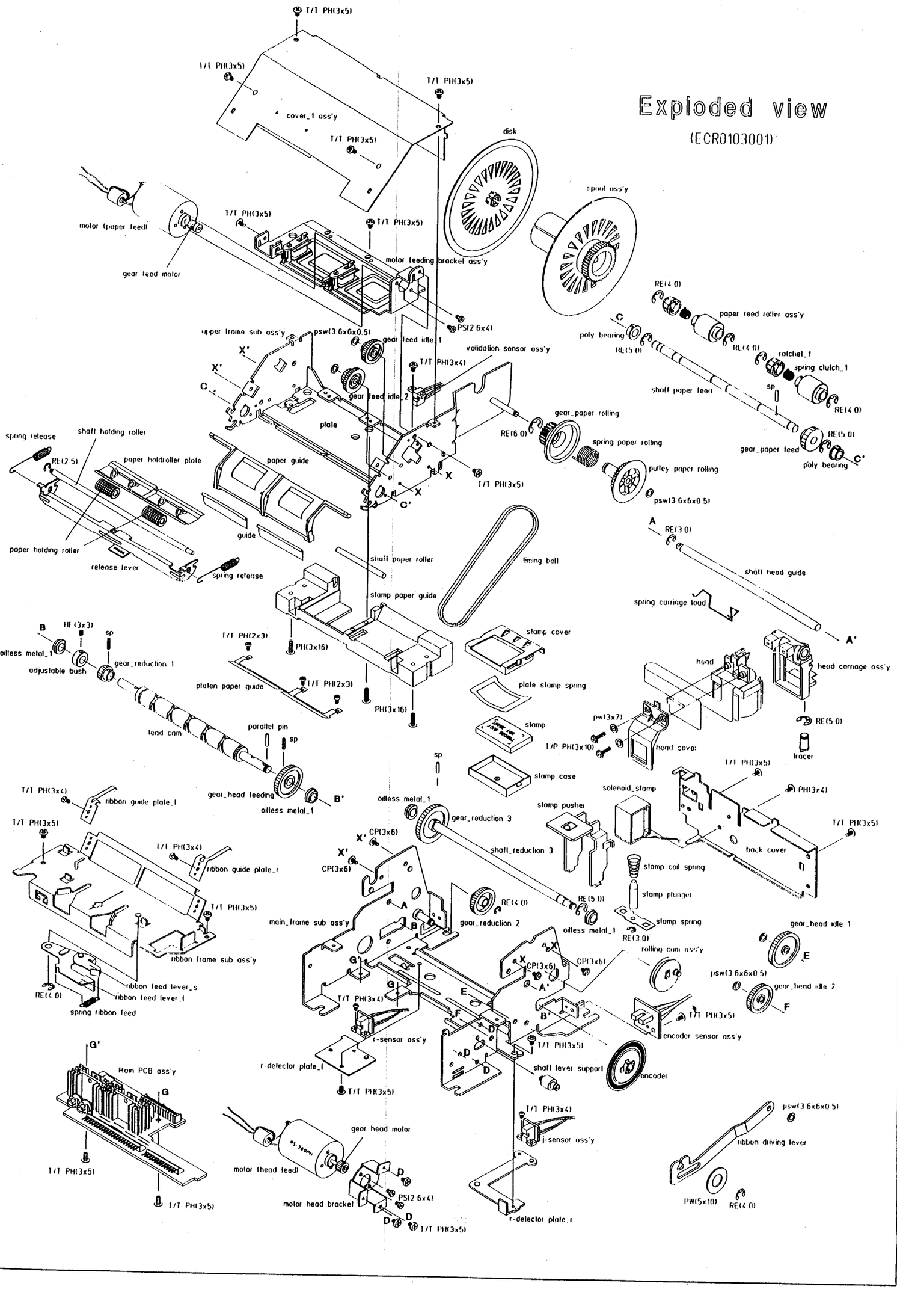
Exploded view

(ECR0103001)



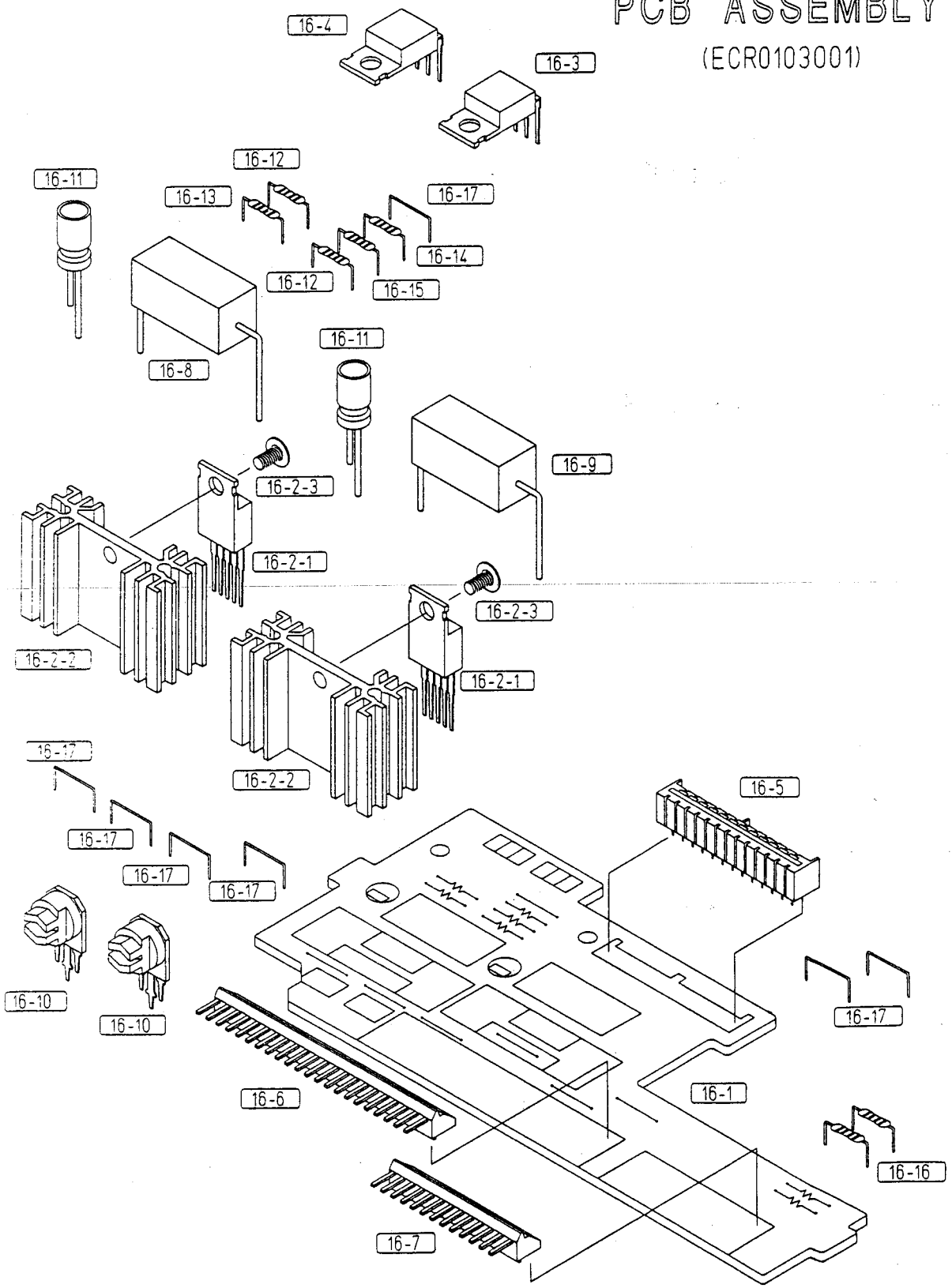
Exploded view

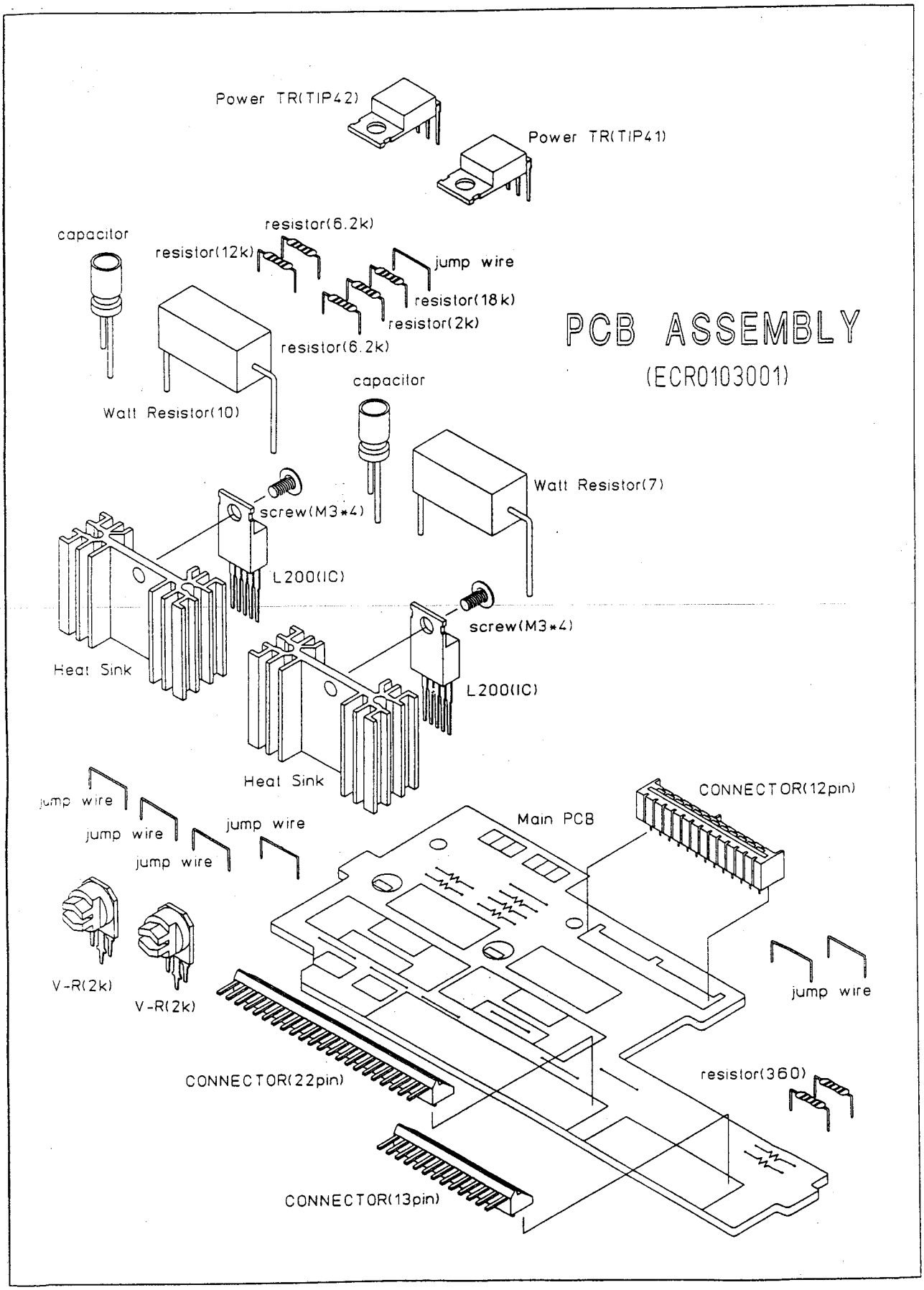
(ECR0103001)



PCB ASSEMBLY

(ECR0103001)



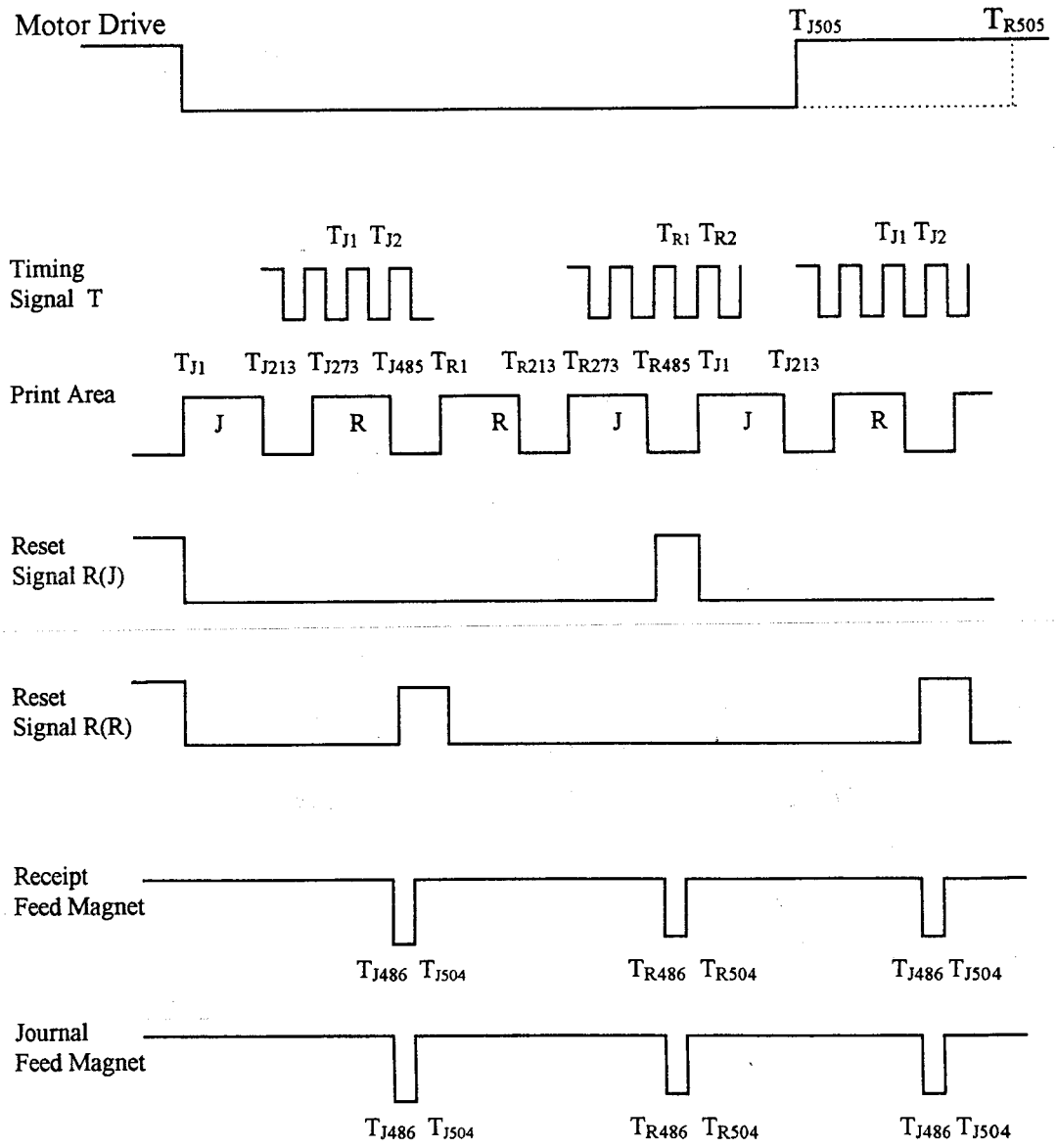


PCB ASSEMBLY

(ECR0103001)

9. Timing Chart

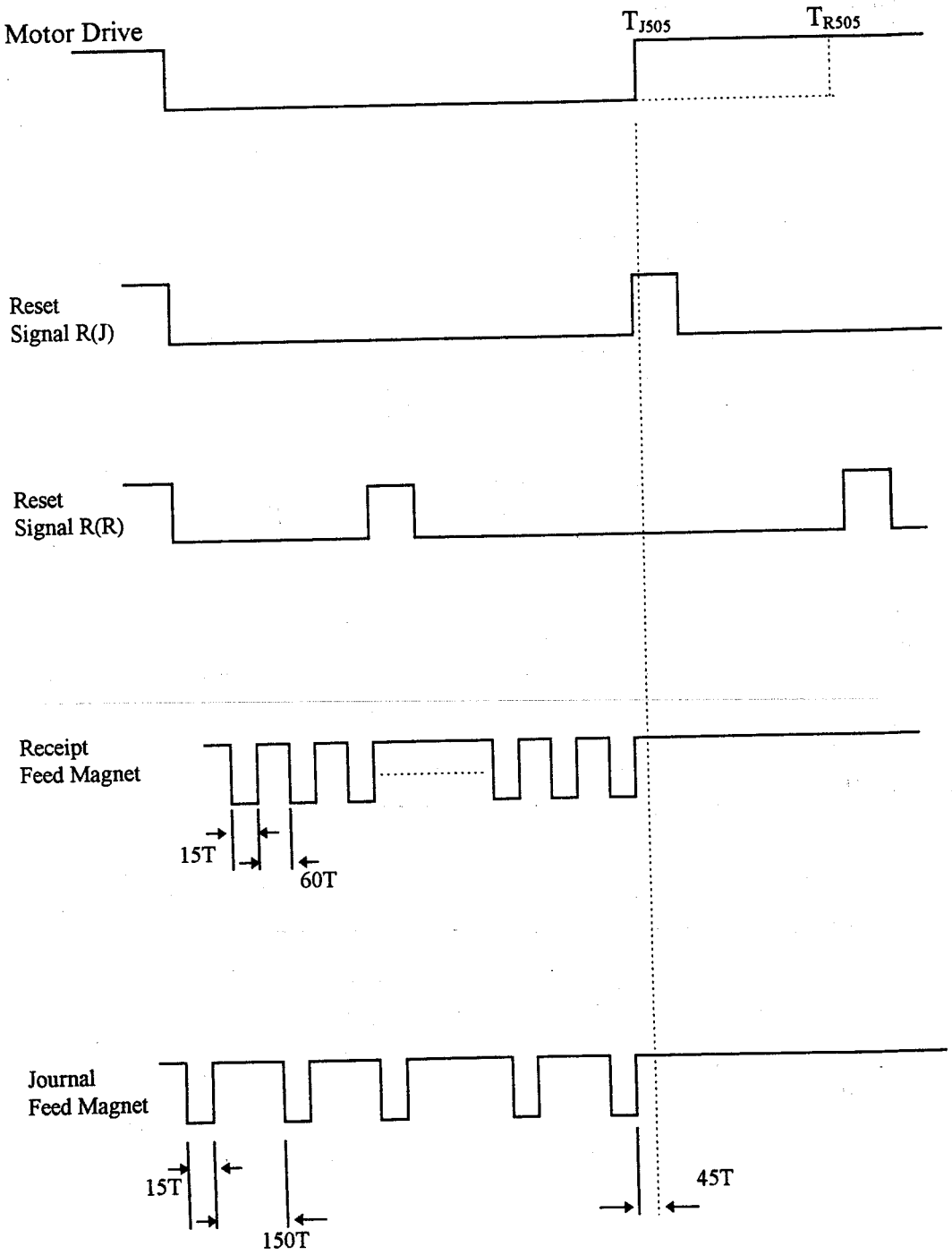
printing and paper feed



1. Motor is turned off at T_{J505} or T_{R505} .

2. On validation print,printing action is turned on at T_{J1} -$_{J485}$ and $T_{R1\text{-}R485}$
   Motor is turned off at T_{R505} or T_{J505} .

Fast feeding



Receipt issueing